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16. Abstract (Limit: 200 words) The DIANA system was developed for use by the data processing installations disk manager. It is a tool for evaluating and improving the effectiveness and control of the users mass storage resource on Honeywell 6000 systems. DIANA collects and provides reports on removable spindle activity used to identify spindle contention and pack usage. Also, DIANA collects static type information on location, size, and number of allocations for disk files. The generated reports will help the disk manager to determine proper placement of files.					
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1 February 1980

Automatic Data Processing Systems and Procedures

H6000 DISK ANALYSIS (DIANA) SYSTEM: Q038/EK

COMPUTER OPERATION MANUAL

This manual provides the H6000 DPI operations personnel with the information to operate the DIANA system. The DIANA system may be executed through either batch input from cards or time-sharing terminals.

This manual has been written to be easily understood by its primary audience. However, there are certain words that are commonly used in performing the functions described here. These are listed in the paragraph titled "Terms and Abbreviations." We advise you to review them before reading this document.

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SECTION 1. GENERAL

1.1 PURPOSE OF THE COMPUTER OPERATION MANUAL. The objective of this computer operation manual for the H6000 Disk Analysis (DIANA) System is to provide computer control and computer operator personnel with a detailed operational description of the system and its associated environment with which they will be concerned during the performance of their duties.

1.2 PROJECT REFERENCES. Documents pertinent to the DIANA System are as follows:

a. AFM 171-606, Volume II, H6000 Disk Analysis (DIANA) System: Q038/EK.

b. AFM 171-100, Volumes I and II, Automated Data Systems (ADS) Standards, 10 September 1979.

c. WWMCCS SCF Users Guide, Technical Memorandum, TM184-78 (Rev 1), 1 December 1978.

1.3 TERMS AND ABBREVIATIONS.

- a. Allocated - Amount of disk space occupied by a user's file.
- b. Assigned - Maximum amount of disk space available to a UMC.
- c. Available - Disk space assigned but not allocated.
- d. BCD - Binary Coded Decimal.
- e. BLINK - A disk storage metric: one blink = five links.
- f. Cat - Catalog.
- g. CPE - Computer Performance Evaluation.
- h. CPM - Computer Performance Management.
- i. Current LLink - A 320-word block currently occupied by a file.
- j. DIANA - H6000 Disk Analysis System.
- k. DPI - Data Processing Installation.
- l. FMS - File Management Supervisor.
- m. FORTRAN - Formula Translation Language.
- n. GCOS - General Comprehensive Operating Supervisor.

- o. GMAP - Macro Assembler Program Language.
- p. GSEP - General SCF Expansion Program.
- q. GMF - Generalized Monitor Facility.
- r. KW - A general H6000 storage metric: one KW = 1024 words.
- s. Link - A disk storage metric: one link = 3840 words.
- t. LLink - A disk storage metric: one LLink = 320 words.
- u. MAJCOM - Major Command.
- v. PS - Program Specification.
- w. SCF - Statistical Collection File.
- x. SMC - System Master Catalog.
- y. SYRUP - System Resource Utilization Package.
- z. SYSOUT - System Output.
- aa. TSS - Time-Sharing System.
- bb. UMC - User Master Catalog.
- cc. WWMCCS - Worldwide Military Command Control System.
- dd. XSCF - Expanded Statistical Collection File.

SECTION 2. SYSTEM APPLICATION

2.1 SYSTEM APPLICATION. The DIANA system and procedures provide a logical approach for disk management on the H6000. The procedures, derived from previous CPM studies, are designed to allow disk managers to obtain an overview of the total disk subsystems in an operational state. DIANA is a total disk management system which provides disk managers with the capability to manage all or selected portions of their disk resource, regardless of configuration.

2.2 SYSTEM ORGANIZATION. DIANA is a modular system. Two monitors collect disk analysis data which is in turn processed through several data reduction programs to produce both technical and management reports.

a. Removable Disk Monitor. This unit is comprised of the dynamic Disk Pack Monitor and the associated data reduction program, EKM3FO (see figure 2-01).

b. File Description Monitor. This unit is comprised of the Catalog File Description Monitor, EKM4FO, and the associated data reduction programs: the Basic Utilization Report Program, EKM5FO, and the Disk Map Program, EKM8FO (see figure 2-02).

c. Disk Interval Analysis. This unit deals with the other data reduction programs, EKM6FO and EKM7FO (see figure 2-03), which analyzes and produces reports from the data base produced by the Catalog/File Descriptor Monitor.

2.3 PROGRAM INVENTORY. All DIANA programs are unclassified. The following seven programs are included in this system:

2.3.1 EKM1FO. Removable Disk Pack Monitor collects information about removable spindle and pack utilization and stores it on the SCF file in user record Type 732.

2.3.2 EKM3FO. The Removable Disk Pack Data Reduction Program processes Type 732 records from the XSCF tape and produces reports on removable disk pack usage.

2.3.3 EKM4FO. The Catalog/File Descriptor Monitor accesses GCOS system tables and extracts information on file and catalog activity.

2.3.4 EKM5FO. The Basic Utilization Report Program generates five user selected reports on disk file and catalog usage.

2.3.5 EKM6FO. The Disk Interval Utilization Program modifies information collected by EKM4FO to reflect activity of disk files on a time selectable basis. Altered data from EKM6FO is next processed by EKM7FO.

2.3.6 EKM7FO. The Disk Pack Catalog/File Data Reduction Program creates reports allowing users to analyze allocation activity by pack, catalog, and file.

2.3.7 EKM8FO. The Disk Map Program generates a map of user file space on fixed and removable disk.

2.4 FILE INVENTORY.

FILE ID	TITLE	MEDIUM
DIANA/LIBRARY	DIANA System	Disk
SCF	Statistical Collection File	Tape
XSCF	Expanded Statistical Collection File	Tape
CEKM3FODU	Parameters	Card
FEKM4FONU	Data Base	Disk/Tape
CEKM4FODU	Parameters	Card
CEKM5FODU	Parameters	Card
CEKM6FODU	Parameters	Card
FEKM6FONU	Merged Data Base	Disk/Tape
CEKM8FODU	Parameters	Card

2.5 PROCESSING OVERVIEW. DIANA does not interface with any other standard systems. Batch or time-sharing execution can be routinely accomplished for all programs except the Removable Disk Pack Monitor (EKM1FO) and the Catalog/File Descriptor Monitor (EKM4FO). These monitors must be executed as privileged slaves and require a grant of privity by the operator.

2.5.1 EKM1FO. This program will respond to the granting of privileged slave status with an initiation message, which is followed by a request for operator entry of a sample time interval within the limits 15 to 99 seconds. The response to the entry request should be supplied by the DPI disk manager prior to initiation. EKM1FO will execute until terminated by the operator.

2.5.2 EKM4FO. This program is also a privileged slave but basically collects static information. Following the grant of privity, this program will execute to normal termination under program control. Since each pack to be examined by EKM4FO must be mounted on-line, execution of this program should be limited to nonpeak shifts whenever examination of numerous removable packs is required.

2.6 SECURITY AND PRIVACY. The DIANA system (including inputs, outputs, data base, programs and procedures) is unclassified. There are no privacy restrictions associated with use of the system.

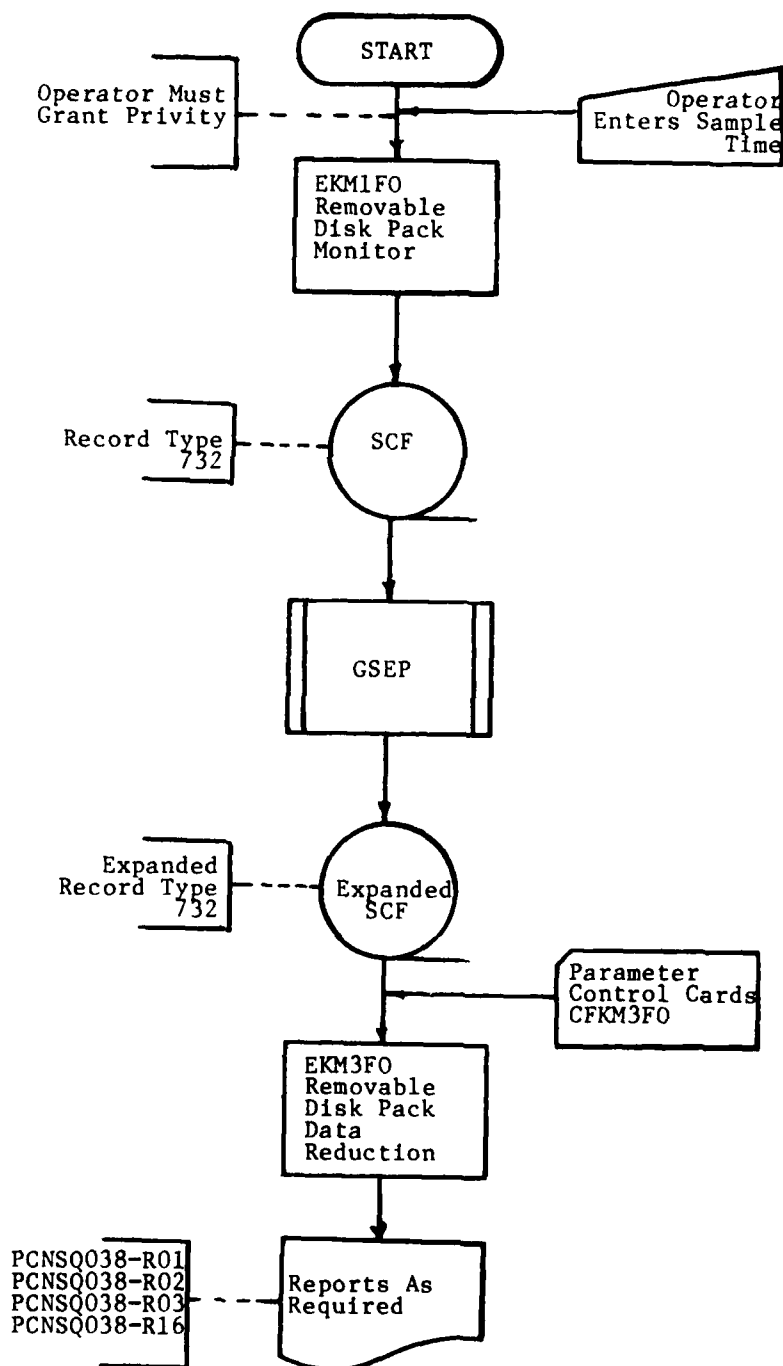


Figure 2-1. Removable Disk Monitor

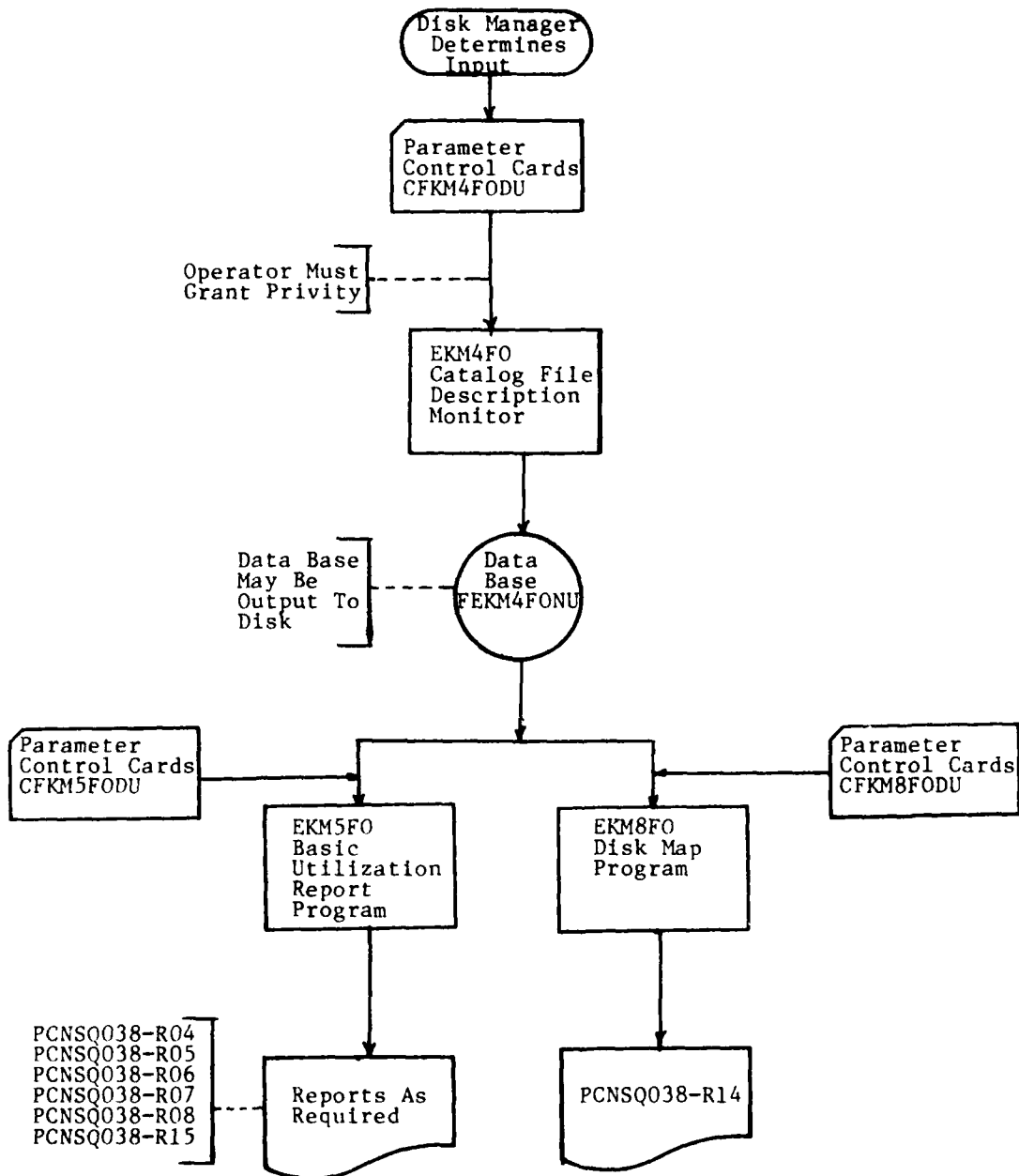


Figure 2-2. File Description Monitor

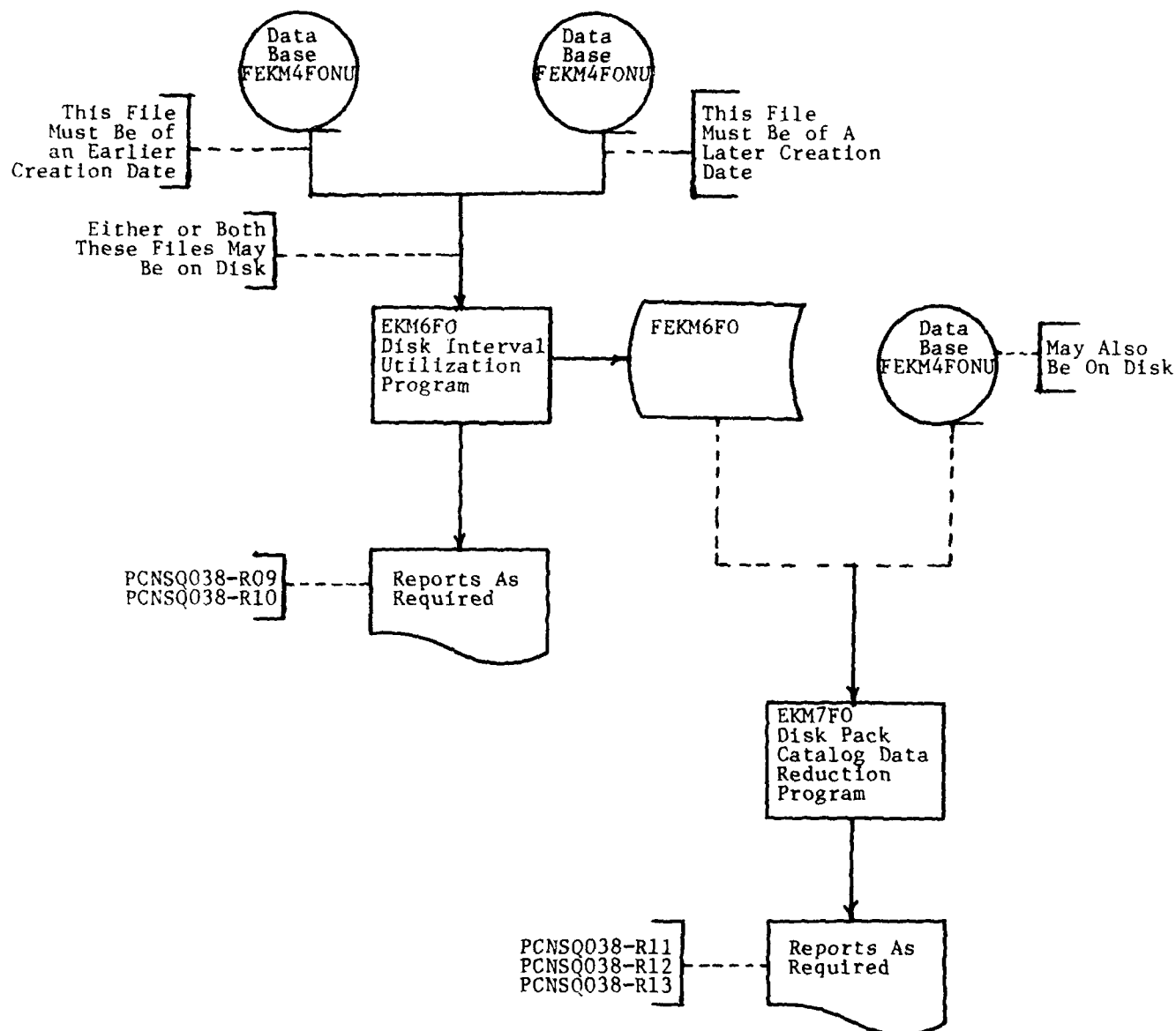


Figure 2-3. Disk Interval Analysis

SECTION 3. DESCRIPTION OF RUNS

3.1 RUN INVENTORY. DIANA is composed of two monitors, EKM1FO and EKM4FO. These monitors collect information and generate separate data bases for use by the data reduction programs.

3.1.1 EKM1FO. The Removable Disk Pack Monitor collects information on removable disk pack and spindle activity.

3.1.2 EKM3FO. The Removable Disk Pack Data Reduction Program produces reports as needed for summary or detail of pack and spindle activity.

3.1.3 EKM4FO. The Catalog File Description Monitor gathers static information on the structure, usage and absolute location of cataloged files. The information can be gathered on either fixed or removable disk as required.

3.1.4 EKM5FO, EKM6FO, EKM7FO AND EKM8FO. These Catalog File Description Reports produce reports from data gathered by disk monitor EKM4FO. Execution of one or more of these programs will produce a variety of reports which may be selected on an as required bases.

3.2 PHASING. Phasing consists of user decision points which evolve from utilization of outputs as described in section 2 of this manual. Processing initiated by the user follows two paths which are:

3.2.1 RECORD CREATION. EKM1FO and EKM4FO create data base files which contain disk utilization data.

3.2.2 REPORT GENERATION. Data collected during the record creation phase is analyzed to produce reports according to user requirements as indicated in the program input parameters.

3.3 RUN DESCRIPTION - EKM1FO. This disk monitor collects utilization data on removable pack assets for output to the SCF tape as a record Type 732. The number of records will vary depending on the time intervals specified for the collection of samples.

3.3.1 CONTROL INPUTS. Job Control Language.

1	8	16
\$	IDENT	(USER SPECIFIED)
\$	USERID	(USER SPECIFIED)
\$	PROGRAM	EKM1FO
\$	LIMITS	49,3K,,1K
\$	PRMFL	**,R,R,USER/RESTORED/LIBRARY

1 8 16
\$ PRIVITY
\$ ENDJOB

a. After initiation of the job, GCOS will ask for privity to be granted. When the operator grants privity, the following messages will print on the console:

(1) Initiation Messages.

EKM1FO ENTER TIME 15-99.

To this request the operator must enter a sample time between 15 and 99 seconds as specified by the disk manager. If a wrong parameter is entered, this message is printed:

LIMITS VIOLATED-REENTER

(2) Termination Message. The operator must terminate EKM1FO to stop processing. This will be done at a time specified by the disk manager. Termination initiates the following message:

EKM1FO TERMINATING

3.3.2 MANAGEMENT INFORMATION.

- a. Run Identification. Removable Disk Pack Monitor (EKM1FO).
- b. The monitor produces Type 732 SCF user records. It is designed to use 3K or less of memory.
- c. Security. Unclassified.
- d. Method of Initiation. As required through batch or spawned batch.
- e. A waiver from the operational standards of AFM 171-100, Volume II, has been granted for use of the \$ PRIVITY control card and the nonstandard console message.
- f. Problem Contacts. AFDSDC/SCCA, AUTOVON 921-4021.

3.3.3 INPUT-OUTPUT FILES.

- a. Input Files. None.
- b. Output Files.

FILE ID	TITLE	CLASS	MEDIUM	DISP
SCF	Record Type 732	Unclass	Tape	DPI

3.3.4 OUTPUT REPORTS. NA.

3.3.5 REPRODUCED OUTPUT REPORTS. NA.

3.3.6 RESTART/RECOVERY PROCEDURES. There are no specific restart/recovery procedures for program EKM1FO. Whenever a system problem occurs and program EKM1FO is terminated, a restart can be accomplished by reinitiating the job.

3.4 RUN DESCRIPTION - EKM3FO. The Type 732 records are extracted from the SCF tape and expanded by GSEP. These records are then processed by EKM3FO to develop reports depicting removable pack and spindle utilization. A detail report illustrating spindle activity within certain time intervals is also available.

3.4.1 CONTROL INPUTS. Job Control Language.

1	8	16
\$	IDENT	(USER SPECIFIED)
\$	USERID	(USER SPECIFIED)
\$	PROGRAM	EKM3FO
\$	LIMITS	,35K
\$	PRMFL	**,R,R,USER/RESTORED/LIBRARY (see note)
\$	SYSOUT	06
\$	SYSOUT	10
\$	SYSOUT	11
\$	SYSOUT	12
\$	SYSOUT	13
\$	SYSOUT	14
\$	SYSOUT	15
\$	SYSOUT	16
\$	SYSOUT	17
\$	SYSOUT	18

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1	8	16
\$	TAPE9	02,X1D,,NNNNN,,XSCF-TAPE
\$	FILE	03,X2R,20L
\$	FILE	04,X3R,20L
\$	FILE	S1,S1R,20R
\$	FILE	S2,S2R,20R
\$	FILE	S3,S3R,20R
\$	DATA	05

(Input parameter card format described in
AFM 171-606, Volume II)

\$ ENDJOB

NOTE: The PRMFL card must reflect a program library file previously established by following instructions in attachment 1.

3.4.2 MANAGEMENT INFORMATION.

a. Run Identification. Removable Disk Pack Data Reduction Program (EKM3FO).

b. The run-time will vary depending upon the amount of records to be analyzed. The Detail by Report (PCN SQ038R02) volume of print varies directly with selected time-interval input parameters.

c. Security. Unclassified.

d. Method of Initiation. As required through batch or spawned batch mode.

e. A waiver from the operational standards of AFM 171-100, Volumes I and II, has been granted to omit the PCN parameter control card and for use of nonstandard file codes.

f. Problem Contacts. AFDSDC/SCCA, AUTOVON 921-4021.

3.4.3 INPUT-OUTPUT FILES.

a. Input Files.

FILE ID	TITLE	CLASS	MEDIUM	DISP
XSCF	Expanded SCF	Unclas	Tape	DPI
CEKM3FODU	Input Parameters	Unclas	Card	DPI

b. Output Files. None.

3.4.4 OUTPUT REPORTS.

PCN	TITLE	CLASS	MEDIA	VOLUME	DISP
SQ038-R01	Spindle Summary	Unclas	Printer	Low	Disk Manager
SQ038-R02	Detail by Spindle	Unclas	Printer	Varies	Disk Manager
SQ038-R03	Summary by Device Type	Unclas	Printer	Low	Disk Manager
SQ038-R16	Input Records/ Parameter Cards Information	Unclas	Printer	Low	Disk Manager

3.4.5 REPRODUCED OUTPUT REPORTS. NA.

3.4.6 RESTART/RECOVERY PROCEDURES.

- a. Purge output in accordance with local DPI procedures.
- b. Correct cause of the abort.
- c. Rerun the job.

3.5 RUN DESCRIPTION - EKM4FO. This program collects data, at the file level, from GCOS system tables. The data collected contains file space descriptors for files on permanent or removable (disk) media. Records are stored on tape or disk for further processing.

3.5.1 CONTROL INPUTS. Job Control Language.

1	8	16
\$	IDENT	(USER SPECIFIED)
\$	USERID	(USER SPECIFIED)

1	8	16
\$	PROGRAM	EKM4FO
\$	LIMITS	40,24K
\$	PRIVITY	
\$	NNNPK	AA,X1D,,AAAAA,,PUBLIC (Note 1)
\$	PRMFL	** ,R,R,USER/RESTORED/LIBRARY (Note 2)
\$	SYSOUT	06
\$	TAPE9	03,T1S,,99999,,FEKM4FONU

OR

\$	PRMFL	03,W,S,USER/FILE NAME (Note 3)
\$	DATA	05

(Input parameter card format
described in AFM 171-606, Volume II)

*
* Subsequent
* activities

\$ ENDJOB

NOTE 1: Usage of NNNPK is optional. The NNNPK cards are only needed if information is to be collected on removable packs. The number of these cards within an activity can not exceed the number of removable spindles. If information is desired on more packs, then subsequent activities will be required. Also, different file codes for each NNNPK card are required such as: AA, BB, CC, DD, etc.

NOTE 2: The PRMFL card must reflect a program library file previously established by instructions in attachment 1.

NOTE 3: This file may be created on either disk or tape media as shown.

3.5.2 MANAGEMENT INFORMATION.

a. Run Identification. Catalog/File Descriptor Monitor (EKM4FO).

b. The run-time will vary depending upon the size and configuration of the disk resource to be examined. Also, this program can require the mounting of several disk packs.

c. Security. Unclassified.

d. Method of Initiation. As required through batch or spawned batch mode.

e. A waiver from the operational standards of AFM 171-100, Volumes I and II, has been granted for the use of the \$ PRIVITY control card, for omission of the standard PCN parameter control card, and for use of nonstandard file codes.

f. Problem Contacts. AFSDSC/SCCA, AUTOVON 921-4021.

3.5.3 INPUT-OUTPUT FILES.

a. Input Files.

FILE ID	TITLE	CLASS	MEDIUM	DISP
CEKM4FODU	Parameters	Unclas	Card	Disk Manager

b. Output Files.

FILE ID	TITLE	CLASS	MEDIUM	DISP
FEKM4FONU	Data Base EKM4FO	Unclas	Disk/Tape	DPI

3.5.4 OUTPUT REPORTS.

PCN	TITLE	CLASS	MEDIA	VOLUME	DISP
SQ038-R19	Input Parameter Cards	Unclas	Printer	Low	Disk

3.5.5 REPRODUCED OUTPUT REPORTS. NA.

3.5.6 RESTART/RECOVERY PROCEDURES. If job aborts, resolve as follows:

- Purge output in accordance with local DPI procedures.
- Correct cause of the abort.
- Rerun the job.

3.6 RUN DESCRIPTION - EKM5FO. This program generates reports for use in day-to-day control of disk resources.

3.6.1 CONTROL INPUTS. Job Control Language.

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1	8	16
\$	IDENT	(USER SPECIFIED)
\$	USERID	(USER SPECIFIED)
\$	PROGRAM	EKM5FO
\$	LIMITS	,36K
\$	PRMFL	**,R,R,USER/RESTORED/LIBRARY (Note 1)
\$	TAPE9	08,X1D,,NNNNN,,FEKM4FONU (Note 2)
\$	FILE	09,X2R,20L
\$	FILE	S1,S1R,20R
\$	FILE	S2,S2R,20R
\$	FILE	S3,S3R,20R
\$	SYSOUT	24
\$	SYSOUT	25
\$	SYSOUT	26
\$	SYSOUT	27
\$	SYSOUT	28
\$	SYSOUT	06
\$	DATA	05

(Input parameter card format
described in AFM 171-606, Volume II)

\$ ENDJOB

NOTE 1: The PRMFL card must reflect a program library file previously established by following instructions in attachment 1.

NOTE 2: This file may also be on disk as shown in paragraph 3.5.1.

3.6.2 MANAGEMENT INFORMATION.

a. Run Identification. Basic Utilization Report Program (EMK5FO).

b. Run-time varies directly with the amount of data to be analyzed. The volume of printing for the Alert List (PCN SQ038-R04), PERM Disk Utilization Summary (PCN SQ038-R05) and Removable Disk Utilization

Summary (PCN SQ038-R06) varies with the amount of data and the request for information by the input parameters.

c. Security. Unclassified.

d. Method of Initiation. As required through batch or spawned batch mode.

e. A waiver from the operational standards of AFM 171-100, Volumes I and II, has been granted to omit the PCN parameter control card and for use of nonstandard file codes.

f. Problem Contacts. AFSDSC/SCCA, AUTOVON 921-4021.

3.6.3 INPUT-OUTPUT FILES.

a. Input Files.

FILE ID	TITLE	CLASS	MEDIUM	DISP
FEKM4FONU	Data Base EKM4FO	Unclas	Tape	DPI
CEKM5FODU	Parameters	Unclas	Card	DPI

3.6.4 OUTPUT REPORTS.

PCN	TITLE	CLASS	MEDIA	VOLUME	DISP
SQ038-R04	Alert List	Unclas	Printer	Varies	Disk Manager
SQ038-R05	PERM Disk Utiliza- tion Summary	Unclas	Printer	Varies	Disk Manager
SQ038-R06	RMVBL Disk Utiliza- tion Summary	Unclas	Printer	Varies	Disk Manager
SQ038-R07	H6000 Disk Status Summary	Unclas	Printer	Low	Disk Manager
SQ038-R08	List of UMC Catalogs	Unclas	Printer	Low	Disk Manager
SQ038-R15	Parameter Cards/ Errors List	Unclas	Printer	Low	Disk Manager

3.6.5 REPRODUCED OUTPUT REPORTS. NA.

3.6.6 RESTART/RECOVERY PROCEDURES. Locally determined, based on user purpose.

a. Purge output in accordance with local DPI procedures.

b. Correct cause of abort.

c. Rerun the job.

3.7 RUN DESCRIPTION - EKM6FO. This program is executed to provide reports on file creation and deletion changes to create a merged file for input into EKM7FO. It should be followed by EKM7FO to produce trending reports.

3.7.1 CONTROL INPUTS. Job Control Language.

1	8	16
\$	IDENT	(USER SPECIFIED)
\$	USERID	(USER SPECIFIED)
\$	PROGRAM	EKM6FO
\$	LIMITS	8,20K
\$	PRMFL	**,R,R,USER/RESTORED/LIBRARY (Note 1)
\$	FILE	01,X3R,20L
\$	FILE	02,X4R,20L
\$	FILE	03,X5S,20L (Note 3)
\$	TAPE9	11,X1D,,NNNNN,,FEKM4FONU (Note 4)
\$	TAPE9	12,X2D,,NNNNN,FEKM4FONU (Notes 2 and 4)
\$	FILE	S1,,50R
\$	SYSOUT	10
\$	SYSOUT	20
\$	SYSOUT	06
	(New activity of EKM7FO)	
\$	ENDJOB	

NOTE 1: The PRMFL card must reflect a program library previously established by following instructions in attachment 1.

NOTE 2: File Code 11 must be an old data base file from a previous EKM4FO activity. The creation date for the data base associated with file code 12 must be at least one day prior to the data base creation date for file code 12.

NOTE 3: This is the merged output file, FEKM6FONU. The "S" disposition code should only be used if the file is for input into EKM7FO. Otherwise, use an "R" disposition code such as: X5R.

NOTE 4: Either or both these files may be on disk as shown in paragraph 3.5.1.

3.7.2 MANAGEMENT INFORMATION.

- a. Run Identification. Disk Interval Utilization Program (EKM6FO).
- b. Run-time and print volume varies directly with the size of the data base to be analyzed.
- c. Security. Unclassified.
- d. Method of Initiation. As required through batch or spawned batch mode.
- e. A waiver from the operational standards of AFM 171-100, Volume II, has been granted for the use of nonstandard file codes.
- f. Problem Contacts. AFSDC/SCCA, AUTOVON 921-4021.

3.7.3 INPUT-OUTPUT FILES.

a. Input Files.

FILE ID	TITLE	CLASS	MEDIUM	DISP
FEKM4FONU	Data Base EKM4FO	Unclass	Disk/Tape	DPI
FEKM4FONU	Data Base EKM4FO	Unclass	Disk/Tape	DPI

NOTE: The oldest EKM4FONU file must be associated with file code 11 in the JCL run stream.

b. Output Files.

FILE ID	TITLE	CLASS	MEDIUM	DISP
FEKM6FONU	Data Base EKM6FO	Unclass	Temp Disk	Disk Manager

3.7.4 OUTPUT REPORTS.

PCN	TITLE	CLASS	MEDIA	VOLUME	DISP
SQ038-R09	Old Files Deleted Report	Unclass	Printer	Note	Disk Manager
SQ038-R10	New Files Created Report	Unclass	Printer	Note	Disk Manager
SQ038-R20	Data Base Comparison Error List	Unclass	Printer	Low	Disk Manager

NOTE: The print volume depends upon the variance between the file creation dates of the EKM4FONU files. Normally the greater the difference the larger the print volume.

3.7.5 REPRODUCED OUTPUT REPORTS. NA.

3.7.6 RESTART/RECOVERY PROCEDURES.

- a. Purge output in accordance with local DPI procedures.
- b. Correct cause of the abort.
- c. Rerun the job.

3.8 RUN DESCRIPTION - EKM7FO. This program provides trend analysis reports on disk utilization. It processes output from either EKM4FO or EKM6FO.

3.8.1 CONTROL INPUTS. Job Control Language.

```

1          8          16
$          IDENT          (USER SPECIFIED)
$          USERID          (USER SPECIFIED)
$          PROGRAM          EKM7FO
$          LIMITS          ,19K
$          PRMFL          **,R,R,USER/RESTORED/LIBRARY (Note 3)
$          FILE          -01,X5R,20L (Note 1)

```

OR

```

$          TAPE9          01,X1D,,NNNNN,,EKM4FONU (Note 2)
$          FILE          02,X1R,20L

```


1	8	16
\$	FILE	03,X2R,20L
\$	FILE	04,X4R,20L
\$	FILE	S1,S1R,20R
\$	FILE	S2,S2R,20R
\$	SYSOUT	06
\$	ENDJOB	

NOTE 1: The file associated with file code 01 can be generated from either EKM6FO or EKM4FO. If EKM7FO is run in the same job as EKM6FO, then the \$ FILE card should be used.

NOTE 2: If EKM7FO is run using the data generated by EKM4FO, then either the \$ TAPE9 card or the \$ PRMFL card with the appropriate file information should be used.

NOTE 3: The PRMFL card must reflect a program library previously established by following instructions in attachment 1.

3.8.2 MANAGEMENT INFORMATION.

a. Run Identification. Disk Pack Catalog/File Data Reduction Program (EKM7FO).

b. Run-time and print volume for File Allocation Report (PCN SQ038-R13) varies directly with the size of the data base to be analyzed.

c. Security. Unclassified.

d. Method of Initiation. As required through batch or spawned batch mode.

e. A waiver from the operational standards of AFM 171-100, Volume II, has been granted for the use of nonstandard file codes.

f. Problem Contacts. AFDSDC/SCCA, AUTOVON 921-4021.

3.8.3 INPUT-OUTPUT FILES.

a. Input Files.

FILE ID	TITLE	CLASS	MEDIUM	DISP
FEKM4FONU	Data Base EKM4FO	Unclass	Disk/Tape	DPI

OR

FEKM6FONU	Data Base EKM6FO	Unclass	Disk/Tape	DPI
-----------	---------------------	---------	-----------	-----

NOTE: Only one of the above files is used for input to any one run of EKM7FO.

b. Output Files. None.

3.8.4 OUTPUT REPORTS.

PCN	TITLE	CLASS	MEDIA	VOLUME	DISP
SQ038-R11	Pack Allocation Report	Unclass	Printer	Low	Disk Manager
SQ038-R12	Catalog Allocation Report	Unclass	Printer	Varies	Disk Manager
SQ038-R13	File Allocation Report	Unclass	Printer	Varies	Disk Manager
SQ038-R17	Error List	Unclass	Printer	Low	Disk Manager

3.8.5 REPRODUCED OUTPUT REPORTS. NA.

3.8.6 RESTART/RECOVERY PROCEDURES.

- Purge output in accordance with local DPI procedures.
- Correct cause of abort.
- Rerun the job.

3.9 RUN DESCRIPTION - EKM8FO. This program generates a report from the EKM4FO mapping record. EKM4FO must be executed prior to this run.

3.9.1 CONTROL INPUTS. Job Control Language.

1	8	16
\$	IDENT	(USER SPECIFIED)
\$	USERID	(USER SPECIFIED)
\$	PROGRAM	EKM8FO
\$	LIMITS	,18K
\$	PRMFL	**,R,R,USER/RESTORED/LIBRARY (Note 1)
\$	FILE	01,,X1D,,NNNNN,EKM4ONU (Note 2)
\$	FILE	02,X2R,20L
\$	FILE	03,X3R,20L
\$	FILE	S1,S1R,40R
\$	FILE	S2,S2R,40R
\$	FILE	S3,S3R,40R
\$	SYSOUT	06
\$	DATA	05

(Input parameter card format described
from AFM 171-606, Volume II)

\$ ENDJOB

NOTE 1: The PRMFL card must reflect a program library previously established by following instructions in attachment 1.

NOTE 2: This file may be on disk as shown in paragraph 3.5.1.

3.9.2 MANAGEMENT INFORMATION.

- a. Run Identification. Disk Map Program (EKM8FO).
- b. Run-time varies directly with the amount of data to be analyzed. Print volume varies with the request for information by the input parameters.
- c. Security. Unclassified.
- d. Method of Initiation. As required through batch or spawned batch mode.

e. A waiver has been granted from the operational standards of AFM 171-100, Volumes I and II, to omit the PCN parameter control card and for the use of nonstandard file codes.

f. Problem Contacts. AFSDSC/SCCA, AUTOVON 921-4021.

3.9.3 INPUT-OUTPUT FILES.

a. Input Files.

FILE ID	TITLE	CLASS	MEDIA	DISP
FEKM4FONU	Data Base EKM4FO	Unclas	Disk/Tape	DPI
CEKM4FODU	Parameters	Unclas	Card	DPI

b. Output Files. None.

3.9.4 OUTPUT REPORTS.

PCN	TITLE	CLASS	MEDIA	VOLUME	DISP
SQ038-R14	Disk Map	Unclas	Printer	Varies	Disk Manager
SQ038-R18	Parameter Cards/Errors List	Unclas	Printer	Low	Disk Manager

3.9.5 REPRODUCED OUTPUT REPORTS. NA.

3.9.6 RESTART/RECOVERY PROCEDURES.

a. Purge output in accordance with local DPI procedures.

b. Correct cause of abort.

c. Rerun the job.

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RESTORATION OF DIANA RELEASE TAPE

DIANA is released as a program library file in system loadable format. Restoration of the release must be performed before any programs can be executed. The DIANA Library can be restored to a permanent or temporary file. Examples of JCL needed to restore the Library are:

a. Program Library to PRMFL.

1	8	16
\$	IDENT	(USER SPECIFIED)
\$	USERID	(USER SPECIFIED)
\$	UTILITY	
\$	FFILE	T1,PHYREC
\$	TAPE9	T1,T1D,,NNNNN,,DIANA-RELEASE
\$	PRMFL	F1,W,R,UMC/DIANA/LIBRARY (see note)
\$	FUTIL	T1,F1,RWD/T1/,RREST/1F/
\$	ENDJOB	

NOTE: PRMFL must be created with 25 links before this job is run.

b. Program Library to a temporary file.

1	8	16
\$	IDENT	(USER SPECIFIED)
\$	USERID	(USER SPECIFIED)
\$	UTILITY (Note 1)	
\$	FFILE	T1,PHYREC
\$	FILE	W1,X1S,25R
\$	TAPE9	T1,X2D,,NNNNN,,DIANA-RELEASE

A1-2 AFM 171-806 Vol I Attachment 1

1 February 1980

1 8 16

\$ FUTIL T1,W .RREST/1F/

(DIANA Program (Note 2)
Activities)

\$ ENDJOB

NOTE 1: This activity must precede any jobs containing DIANA program runs.

NOTE 2: The PRMFL cards referencing the DIANA Library in execution activities must be replaced with the following card:

1 8 16

\$ FILE **,X1S

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CHANGE 1
AFM 171-606
Volume I
1 June 1980

Automatic Data Processing Systems and Procedures

H6000 DISK ANALYSIS (DIANA) SYSTEM: Q038/EK

COMPUTER OPERATION MANUAL

AFM 171-606, Volume I, 1 February 1980, is changed as follows:

1. Purpose of Change. To insert a control card for proper execution of EKM5F0 and to correct other documentation errors.

2. Write-In Changes:

Page	Reference	Line	Action
2-4	Figure 2-1		Change File ID for card input from "CFKM3F0" to "CEKM3FOU."
2-5	Figure 2-2		Change File ID for card input from "CFKM4F0DU" to "CEKM4FOU."
			Change File ID for card input from "CFKM5F0DU" to "CEKM5FOU."
			Change File ID for card input from "CFKM8F0DU" to "CEKM8FOU."
3-6	Para 3.5.1	3	Change the "24K" on the \$ LIMITS Card to "27K."
3-8	Para 3.6.1	8	Between the \$ FILE 09 and \$ FILE S1 cards, under Column 1 heading, insert a "\$", beginning under Column heading 8, insert "FILE" and beginning under Column heading 16, insert "10,X3R,20L."
3-12	Para 3.8.1	8	Change the File ID on the \$ TAPE9 from "EKM4FONU" to "FEKM4FONU."
3-15	Para 3.9.1	6	Change the "FILE" to "TAPE9." After the "NNNNN" change to read ",,FEKM4FONU (Note 2)".
A1-1	Para a "NOTE"		Change "25 links" to "27 links."
	Para b	5	Change "25R" to "27R."

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CHANGE 2
AFM 171-606, Vol I
22 May 1981

Automatic Data Processing Systems and Procedures

H6000 DISK ANALYSIS (DIANA) SYSTEM: Q038/EK

COMPUTER OPERATION MANUAL

AFM 171-606, volume I, 1 February 1980, is changed as follows:

1. Purpose of Change. Modify documentation to allow for parameter input to EKM7FO and correct documentation errors.

2. Page Insert Changes. New or revised material is indicated by *.

Remove	Date	Insert
3-13, 3-14	1 Feb 80	3-13, 3-14

3. Write-In Changes:

Page	Reference	Line	Action
2-2	Para 2.4	12	Between FEKM6FONU and CEKM8FODU under FILE ID, insert, "CEKM7FODU". Under TITLE, insert "Parameters" and under MEDIUM, insert "CARD".
2-4	Figure 2-1		Change File ID for card input from "CEKM3FOU" to "CEKM3FODU".
2-5	Figure 2-2		Change File ID for card input from "CEKM4FOU" to "CEKM4FODU".
			Change File ID for card input from "CEKM5FOU" to "CEKM5FODU".
			Change File ID for card input from "CEKM8FOU" to "CEKM8FODU".
3-4	Para 3.4.2.e		Delete paragraph.
	Para 3.4.2.f	1	Renumber paragraph from "f" to "e".
3-6	Para 3.5.1	3	Change limits from ,27K to ,29K.
3-12	Para 3.8.1	6	Change limits from ,19K to ,21K.
		10	Under column heading 16, change "X1D" to "X5D".
A1-1	Para b	7	Under column heading 16, change "X1S" to "Y1S".
A1-2	Note 2	4	Under column heading 16, change "X1S" to "Y1S".

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1	8	16
\$	FILE	03,X2R,20L
\$	FILE	04,X4R,20L
\$	FILE	S1,S1R,20R
\$	FILE	S2,S2R,20R
\$	SYSOUT	06
* \$	DATA	05
\$	ENDJOB	

NOTE 1: The file associated with file code 01 can be generated from either EKM6FO or EKM4FO. If EKM7FO is run in the same job as EKM6FO, then the \$ FILE card should be used.

NOTE 2: If EKM7FO is run using the data generated by EKM4FO, then either the \$ TAPE9 card or the \$ PRMFL card with the appropriate file information should be used.

NOTE 3: The PRMFL card must reflect a program library previously established by following instructions in attachment 1.

3.8.2 MANAGEMENT INFORMATION.

a. Run Identification. Disk Pack Catalog/File Data Reduction Program (EKM7FO).

* b. Run-time and print volume for File Allocation Report (PCN SQ038-R13) varies directly with the size of the data base to be analyzed and the monthly allocation rate requested.

c. Security. Unclassified.

d. Method of Initiation. As required through batch or spawned batch mode.

e. A waiver from the operational standards of AFM 171-100, Volume II, has been granted for the use of nonstandard file codes.

f. Problem Contacts. AFSDSC/SCCA, AUTOVON 921-4021.

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3.8.3 INPUT-OUTPUT FILES.

a. Input Files.

FILE ID	TITLE	CLASS	MEDIUM	DISP
FEKM4FONU	Data Base EKM4FO	Unclass	Disk/Tape	DPI

OR

FEKM6FONU	Data Base EKM6FO	Unclass	Disk/Tape	DPI
-----------	---------------------	---------	-----------	-----

* CEKM7FODU	Parameters	Unclass	Card	DPI
-------------	------------	---------	------	-----

* NOTE: Only two of the above files are used for input to any one run of EKM7FO.

b. Output Files. None.

3.8.4 OUTPUT REPORTS.

PCN	TITLE	CLASS	MEDIA	VOLUME	DISP
SQ036-R11	Pack Allocation Report	Unclass	Printer	Low	Disk Manager
SQ038-R12	Catalog Allocation Report	Unclass	Printer	Varies	Disk Manager
SQ038-R13	File Allocation Report	Unclass	Printer	Varies	Disk Manager
* SQ038-R17	Parameter Card/ Error List	Unclass	Printer	Low	Disk Manager

3.8.5 REPRODUCED OUTPUT REPORTS. NA.

3.8.6 RESTART/RECOVERY PROCEDURES.

a. Purge output in accordance with local DPI procedures.

b. Correct cause of abort.

c. Rerun the job.

3.9 RUN DESCRIPTION - EKM8FO. This program generates a report from the EKM4FO mapping record. EKM4FO must be executed prior to this run.

3.9.1 CONTROL INPUTS. Job Control Language.

(13)

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AF MANUAL 171-606
Volume II
1 February 1980

Automatic Data Processing Systems and Procedures

H6000 DISK ANALYSIS (DIANA) SYSTEM: Q038/EK

USERS MANUAL

This manual provides the functional user with the information necessary to effectively use the DIANA system. It provides procedures and information necessary to use the system.

This manual has been written to be easily understood by its primary audience. However, there are certain words that are commonly used in performing the functions described here. These are listed in the paragraph titled "Terms and Abbreviations." We advise you to review them before reading this document.

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SECTION 1. GENERAL

1.1 PURPOSE OF THE USERS MANUAL. The objective of this manual for the H6000 Disk Analysis System (DIANA) is to provide ADP personnel with information necessary to effectively use the system.

1.2 PROJECT REFERENCES. The DIANA system was developed for use by MAJCOM disk managers as a tool for evaluating and improving the effectiveness and control of disk resources on H6000 systems. Documents pertinent to the DIANA system are:

- a. AFM 171-606, Volume I, H6000 Disk Analysis (DIANA) System: Q038/EK.
- b. Generalized Monitoring Facility (GMF).
- c. System Resource Utilization Package (SYRUP).
- d. AFM 171-100, Volumes I and II, Automated Data System (ADS) Standards, 1 September 1979.
- e. WWMCCS SCF Users Guide, Technical Memorandum, TM 84-78 (Rev 1), 1 December 1978.

1.3 TERMS AND ABBREVIATIONS.

- a. Active Blocks - Number of llinks active within a specified time interval.
- b. Allocated - Amount of disk space occupied by a user's file.
- c. Assigned - Maximum amount of disk space available to a UMC.
- d. Available - Disk space assigned but not allocated.
- e. BCD - Binary Coded Decimal.
- f. Blink - A disk storage metric: 1 blink = 5 links.
- g. CAT - Catalog.
- h. Checkerboarding - Fragmentation of unassigned disk space into small noncontiguous areas.
- i. CLINK - Ten times the file monthly allocation rate divided by the file size in blinks.
- j. CPE - Computer Performance Evaluation.
- k. CPM - Computer Performance Management.

- l. Current LLink - A 320-word block currently occupied by a file.
- m. DIANA - H6000 Disk Analysis System.
- n. DPI - Data Processing Installation.
- o. FMS - File Management Supervisor.
- p. FORTRAN - Formula Translation Language.
- q. GCOS - General Comprehensive Operating Supervisor.
- r. GMAP - Macro Assembler Program Language.
- s. GSEP - General Summary Edit Program.
- t. KW - A general H6000 storage metric: 1 KW = 1024 words.
- u. Link - A disk storage metric: 1 link = 3840 words.
- v. Llink - A disk storage metric: 1 llink = 320 words.
- w. MAJCOM - Major Command.
- x. PERM - Fixed permanent disk space.
- y. PS - Program specification.
- z. SIS - Selective Inquiry System.

aa. Status Connects - An arbitrary value used to flag minimum device activity when it is polled less than or equal to once every eight seconds.

- bb. SMC - System Master Catalog.
- cc. SYRUP - System Resource Utilization Package.
- dd. SYSOUT - System output.
- ee. TSS - Time-Sharing System.
- ff. UMC - User Master Catalog.
- gg. XSCF - Expanded Statistical Collection File.

1.4 SECURITY AND PRIVACY. The DIANA system including inputs, outputs, data base, programs, and procedures is unclassified. There are no privacy restrictions associated with the use of the system.

SECTION 2. SYSTEM SUMMARY

2.1 SYSTEM APPLICATION. The manner in which a site's disk resource is utilized and controlled greatly influences system efficiency. The information needed to manage the disk resource in a logical fashion becomes even more critical when that resource is limited. H6000 disk management typically includes establishing standards for catalogs and files, assigning file space to users, monitoring use of space, determining what files should be placed on fixed or removable disk devices, and insuring appropriate procedures are established for saving and restoring the entire disk system.

The GCOS file system maintains numerous statistics about each cataloged file. Unfortunately, the detail in the available reports makes it difficult to manage resources without extensive manual manipulation of the data.

In recent CPM studies involving disk management, specific strategies were developed that employed the use of various monitors. In addition, automated tools were developed and applied to aid disk managers in determining an appropriate balance between fixed and removable disk. This document provides a logical approach, utilizing DIANA, for disk management on the H6000. The procedures, derived from previous CPM studies, allow managers to obtain an overview of the disk system in an operational state. In addition, the procedures will permit the disk manager to look at selected portions of the system.

2.2 SYSTEM OPERATION. Either one or both of the data collection programs, EKM1FO and EKM4FO, are processed on a site determined basis. Other programs within DIANA produce reports specified by the user. The data collected are extracted from system tables maintained by GCOS. The data are stored in a data base (disk/tape) for input to programs which produce the reports required by the disk manager. Proper use of reports will help the disk manager to: determine whether or not adequate resources exist, isolate abuses to the system, determine proper placement of files, optimize removable pack mounts, and insure timely acquisition of new disk resources for future requirements.

2.3 SYSTEM CONFIGURATION. The DIANA system will be processed on the Honeywell 6000 series ADPE.

2.4 SYSTEM ORGANIZATION. The DIANA system is comprised of seven computer programs:

a. Removable Disk Pack Monitor (EKM1FO). One of two monitor programs providing primary input to the system. This program collects system status data on removable disk spindles. The data collected are acquired from the System Configuration Table (SCT) in which are maintained four-word entries for each device that uses a multiple device channel. EKM1FO will collect data on removable configured DSS181, DSS190, DSS191 and DSS451 devices. The data include the device type, device usage and number of connects to the device. Output from EKM1FO is written to the Statistical Collection File (SCF) in user unique records - Type 732. As

the data are interspersed with other record types, GSEP is used to extract and expand the Type 732 record header and create an XSCF tape for input into EKM3FO.

b. Removable Disk Pack Data Reduction Program (EKM3FO). This program extracts record Type 732 from the XSCF tape. The user may specify the accumulation of data from different time periods to develop time-series maps showing where packs were allocated/mounted. Summary reports depicting removable pack and spindle utilization may also be requested. The reports include information concerning the number of mounts, total time mounted, the total time mounted that at least one user file was allocated, ratio of allocated to mounted time, and the breakdown of the number of spindles available for allocation during the selected time period.

c. Catalog/File Descriptor Monitor (EKM4FO). The second monitor program in the system is EKM4FO. EKM4FO collects detailed data from available system tables at catalog and file level. The user has the option to collect data on all permanent files stored either on fixed or removable disk media. A single activity can collect data on either fixed (PERM) files or files on removable media. If more removable packs are to be surveyed than there are spindles available, a number of separate activities or runs of this monitor can be combined to include the entire removable disk pack population. A card or card-image file, supplied by the user, provides the pack numbers and device names for all removable disk packs and PERM packs to be surveyed. Data are collected on User Master Catalog (UMC) and Catalog/File substructures including a file's creation date, number of allocations, last date allocated, device type and other file sizing parameters. These data, depending on the purpose of follow-on processing, will aid day-to-day control of disk resources, trend analysis, or physical mapping to augment on-going CPE studies. For day-to-day resource control or trending, data should be recorded on magnetic tape and retained. CPE augmentation data are considered perishable and are transferred to the subsequent mapping activity via a temporary disk file. The processing order of the report programs is determined by the user's purpose for running EKM4FO.

d. Basic Utilization Report Program (EKM5FO). EKM5FO provides reports to aid day-to-day control of disk resources. Input for run control and report selection is via cards or as card-image input with a TSS job submission. EKM5FO optionally produces five separate reports: the Alert List, the PERM and Removable Disk Utilization Summary, the H6000 Disk Status Summary and the User Master Catalog (UMC) List. Decisions based on the information contained in these reports will determine what further processing, if any, is necessary.

e. Disk Interval Utilization Program (EKM6FO). EKM6FO is executed to aid trend analysis of disk utilization. If trending is to be based only on data produced during the most recent run of EKM4FO (a single data base), then the file creation dates will provide the basis for analysis and program (EKM6FO) is bypassed. If trending is to be based on a processing interval (multiple data bases), the current data from EKM4FO will be merged with data from a previous run of the monitor. From these

primary input(s), EKM6FO produces a merged output file on temporary disk and two interim reports: the Old Files Deleted Report and the New Files Created Report. The merged output file contains a record for each catalog and file resident on disk throughout the interval between runs of EKM4FO and/or created and still existent at the end of the interval. This file is passed to a subsequent activity for data reduction.

f. Disk Pack Catalog/File Data Reduction Program (EKM7FO). Input for EKM7FO is dependent upon the method chosen for trend analysis. If trending is to be based on file creation alone, a single current run of EKM4FO will provide the input. When EKM6FO has been run to provide trending over a processing interval, the merged output file from that program will be the input. The latter case should be predominant and is recommended for trend analysis. EKM7FO reduces the data and produces three detailed reports on system disk resource allocation: the Pack Allocation Report, the Catalog Allocation Report, and the File Allocation Report.

g. Disk Map Program (EKM8FO). EKM8FO produces an ordered mapping of catalogs and files by cylinder address on all selected disk media. The data base (tape/disk) created by the monitor program (EKM4FO) is used as input. The report format is designed to identify disk checkerboarding and file fragmentation.

2.5 PERFORMANCE.

2.5.1 AVERAGE RESPONSE TIMES. Average response time will vary depending on the purpose of a particular run and the configuration of the site. The data reduction programs may be executed in routine batch or spawned batch mode through the standard Time-Sharing Module. Response times are a function not only of DIANA design, but also of the number, size and complexity of other systems which are competing for resources. Because these competitors are, at any one point in time, both Air Force-standard and command-unique systems in almost unlimited combinations, system performance in terms of response time will vary considerably from command to command.

2.5.2 LIMITATIONS. Two exceptions to the routine batch or spawned batch execution of programs are the two data collectors: the Removable Disk Pack Monitor (EKM1FO) and the Catalog/File Descriptor Monitor (EKM4FO). These monitors must be run as privileged slaves and require the operator to grant privity.

2.6 DATA BASE. The DIANA data base is created as follows:

a. EKM1FO collects data solely on the status of removable disk spindles. The data are then stored in Type 732 records on the SCF tape. Attachment 1 contains the record format.

b. EKM4FO collects data maintained in the GCOS system tables at the catalog and file level. The data are primarily file descriptors and parameters for all permanent files stored on PERM or removable media. A 50-word record is created by EKM4FO. Utilization of this record depends

on the purpose of the user. Attachment 2 contains the record format.

The data collected are then input to other programs to create management or trend analysis reports.

2.7 GENERAL DESCRIPTION OF INPUTS, PROCESSING, OUTPUTS. Following is a general explanation of the system inputs, processing and outputs by program.

2.7.1 REMOVABLE DISK PACK MONITOR. EKM1FO collects data on the status of removable disk spindles by writing record Type 732 to the SCF. This information is then input to EKM3FO.

a. Inputs. Input is collected from the Secondary System Configuration Table (SCT) which maintains four-word entries for each device that uses a multiple device channel. EKM1FO will collect data on removable configured, DSS181, DSS190, DSS191 and DSS451 devices. Data collected on a device include type, number, usage and number of connects to the device.

b. Processing. EKM1FO collects utilization data on a maximum of 50 removable devices. This is based on the current availability of removable spindles at ADPS 10 and ADPS 80 sites. Once EKM1FO is initiated by the operator and an acceptable sample time entered, the program begins data collection at the specified interval. Operating in master mode, unique Type 732 records are built from snapshots of the Secondary System Configuration Table and written to the SCF tape.

c. Output. The output is a unique user record Type 732. Format and content are shown in attachment 1.

2.7.2 REMOVABLE DISK PACK DATA REDUCTION PROGRAM. EKM3FO extracts Type 732 records from the XSCF tape. It then produces optional reports depicting removable pack and spindle utilization. Multiple reports can be produced on different time periods specified by the user.

a. Inputs. Inputs consist of XSCF tapes containing Type 732 records, and card input parameters as covered in paragraph 3.2.1.2. Up to 10 different time periods can be specified with an option to produce three different summary listings for each.

b. Processing. An initial sort of extracted Type 732 records facilitates report processing. Parameters for the reports are read from the user furnished cards which specify the reports and times intervals needed. Reports are generated according to the parameters entered.

c. Outputs. A summary of the monitored period and report options requested by the user is produced. Output products consist of one or more of the following:

(1) Spindle Summary Report (PCN SQ038-R01). Provides a summarization of activity occurring on each removable spindle.

(2) Detail By Spindle Report (PCN SQ038-R02). Provides a detailed map of time sequenced activity occurring on each removable spindle.

(3) Summary By Device Type (PCN SQ038-R03). Provides a summarization of each removable pack mounted during the monitored period.

(4) Input Records/Parameter Cards Information (PCN SQ038-R16). Provides a summary of data on the input tape along with a listing of parameters entered.

2.7.3 CATALOG/FILE DESCRIPTOR MONITOR. EKM4FO collects data on catalog/file descriptors for all files on fixed or removable disk media. This program produces a data base which is input to EKM5FO, EKM6FO, EKM7FO or EKM8FO depending on the purpose as outlined in attachment 1.

a. Inputs. Cards or card images providing the type of device to be surveyed. If removable data is required, the pack name must be entered. Data are collected on the specified packs from the GCOS systems tables.

b. Processing. EKM4FO is a privileged slave and requires operator intervention to grant privy. The monitor collects catalog/file descriptor data on specified media. A single activity can collect data on as many packs as there are removable spindles. If more packs are to be surveyed than the number of spindles available, multiple activities should be combined to include the entire removable disk pack population.

c. Output. Outputs are 50-word records written either to a tape or disk media containing User Master Catalogs and catalog/file substructure data, file creation date, number of allocations, last date allocated, device type and other file sizing parameters. The record format is shown in attachment 2.

2.7.4 BASIC UTILIZATION REPORT PROGRAM. EKM5FO produces five separate summary reports. The disk manager should use information contained in these reports to determine what further DIANA processing is necessary.

a. Inputs. Inputs consist of records produced by EKM4FO and user supplied card input for record selection options. Options are covered in paragraph 3.2.1.4 of this manual.

b. Processing. Report options are determined from the user supplied cards before record summarization begins. File data are accumulated by USERID, organization, command or system. Reports are then produced according to requirements specified.

c. Outputs. The following reports are produced:

(1) Alert List (PCN SQ038-R04). Lists files not accessed for a given number of days residing on PERM disk.

(2) PERM Utilization Summary (PCN SQ038-R05). Summarizes

utilization of fixed space for each USERID, organization, command, and system.

(3) Removable Disk Utilization Summary (PCN SQ038-R06). Summarizes the utilization of space on removable packs.

(4) H6000 Disk Status Summary (PCN SQ038-R07). Provides a one-page summary of PERM disk resources.

(5) User Master Catalog List (PCN SQ038-R08). Provides a summarized list of USERIDs used to track assignment of PERM space.

(6) Parameter Cards/Error List (PCN SQ038-R15). Provides a list of parameter cards with any associated errors.

2.7.5 DISK INTERVAL UTILIZATION PROGRAM. EKM6FO is an aid to trend analysis of file utilization.

a. Inputs. Input files are generated by the Catalog/File Descriptor Monitor (EKM4FO).

b. Processing. Input files are sorted by catalog/file strings for summary reporting. Each input file is sorted and stored on a temporary disk file which is then processed and merged onto the output file. The processing involves identification of three distinct catalog/file conditions:

(1) Files created after the older of the two input files was created.

(2) Files deleted prior to creation of the newer input data base.

(3) Files common to both data bases.

The first condition results in a file being listed on the New Files Created Report and a detail record being written to the merged output file. The second condition results in a file being listed on the Old Files Created Report. No record is written to the merged output file. The third and final condition is handled in two distinctly different ways depending upon the file creation dates. First, if the creation dates are different for the same file on both inputs, the files are considered to be different and each is handled separately (as indicated for conditions 1 and 2). The file on the older data base is written to Old Files Deleted Report and the file on the newer data base is written to both the merged output and the New Files Created Report. Second, where file creation dates are identical, an update is made to the newer of the two records prior to its being written to the merged output file.

c. Outputs. Four outputs are produced.

(1) Merged output file which reflects file activity occurring between two specified time intervals. This file can be input to EKM7FO.

(2) Old Files Deleted Report (PCN SQ038-R09). Displays files deleted during the time period.

(3) New Files Created Report (PCN SQ038-R10). Displays files created during the time period.

(4) Data Base Comparison Error List (PCN SQ038-R20). Displays records deleted due to file creation dates.

2.7.6 DISK PACK CAT/FILE DATA REDUCTION PROGRAM. EKM7FO produces removable pack, catalog, and file reports from data collected by EKM4FO or from the merged output file of EKM6FO. Disk utilization at the device and catalog/file level is determined by calculating the number of times files associated with catalogs or devices are allocated.

a. Inputs. Inputs are EKM4FO or EKM6FO records. Source of input is dependent on the purpose for running EKM7FO.

b. Processing. Two important metrics provide the basis for three reports. First, the Monthly Allocate Rate defined as the total number of times the file was allocated divided by the number of days the file has been in existence multiplied by 30 days per month. The second metric is the CLINK rate, defined as 10 times the file's Monthly Allocate Rate divided by the file size in blinks.

c. Outputs. Four output reports are possible.

(1) Pack Allocation Report (PCN SQ038-R11). Displays the utilization of files associated with a particular pack number.

(2) Catalog Allocation Report (PCN SQ038-R12). Displays the utilization of files by catalog.

(3) File Allocation Report (PCN SQ038-R13). Displays all files sorted by a monthly allocation rate.

(4) Error List (PCN SQ038-R17). Gives the number of records, if any, excluded from processing.

2.7.7 THE DISK MAP PROGRAM. EKM8FO provides a map by catalog/file string of the current location of files on disk.

a. Input. Input is from the Catalog/File Descriptor Monitor (EKM4FO)* A card input file specifies processing options.

b. Processing. Input is sorted by physical location with device name. The temporary sorted file is then output by cylinder, indicating starting llink, ending llink, and file size for each catalog/file on a particular device, by name and type. The acceptable device types are DSS180, DSS181, DSS190, DSS191 and DSS451.

c. Outputs. Two output reports are produced.

(1) Disk Map Report (PCN SQ038-R14). A report identifying the location of each file residing on fixed or removable disk.

(2) Parameter/Cards Error List (PCN SQ038-R18). Provides a list of parameter cards with any associated errors.

SECTION 3. STAFF FUNCTIONS RELATED TO TECHNICAL OPERATIONS

3.1 INITIATION PROCEDURES. Routine batch or time-sharing execution can be accomplished for all but two programs. The exceptions are the two data collectors: the Removable Disk Pack Monitor (EKM1FO) and the Catalog/File Descriptor Monitor (EKM4FO). These monitors must be executed as privileged slaves and require the operator to grant privity.

a. EKM1FO will respond to the grant of privity with an initiation message, followed by a request for operator entry of the sample time interval. The message clearly establishes the limits on the entry. The response should be supplied to the operator by the DPI Disk Manager prior to initiation. This message is explained in more detail in AFM 171-606, Volume I. EKM1FO will then execute until terminated by the operator at a time supplied by the DPI Disk Manager.

b. EKM4FO is executed as a privileged slave and requires a grant of privity by the operator. Otherwise, the program will execute as a normal batch job.

3.2 STAFF INPUT REQUIREMENTS. The DIANA system is designed for use by DPI personnel only. Personnel responsible for systems operation, generally disk managers and system analysts, determine the inputs. Utilization of system outputs will be determined by the initiator. Listed below are some factors which should be taken into consideration.

a. Data Reduction modules producing PCN SQ038-R02, PCN SQ038-R04, PCN SQ038-R11, PCN SQ038-R12, and PCN SQ038-R13 should be run during night shifts due to the large amount of output possible.

b. Initiation and processing of EKM4FO should be limited to predetermined night shifts, especially when specified inputs require examination of numerous removable packs. This condition will require multiple pack mounts by the operator and saturate removable resources.

c. The selection of input parameters should be determined or approved by the disk manager.

d. The parameters input to any module, except EKM1FO, must be in card format using either TSS batch (CARDIN) or actual card input.

3.2.1 INPUT FORMATS. Formats for the DIANA system are discussed, by program, in the following paragraphs:

3.2.1.1 EKM1FO. Input consists of three parameters.

a. Start time.

b. Sample time (15 to 99 seconds).

c. Stop time.

All the above parameters must be supplied to the operator for program initiation. Additional information about the console messages is available in AFM 171-606, Volume I.

3.2.1.2 EKM3FO. Input to this program consists of three optional formats. Formats are delineated by a semicolon and more than one option may be specified. Option cards allow the user latitude in selection of processing and print intervals. The three formats are described below:

EKM3FO CARD FORMAT 1	POSITION	INSTRUCTIONS
INCLUDE FROM YYMMDD/HH.TTT	1-26	Up to 10 "Include From" cards may be specified per activity. Dates must be six digits and times between 00.000 and 24.000. All date-time intervals must be mutually exclusive. Default is processing an entire XSCF tape.
TO YYMMDD/HH.TTT	28-43	
ALL	After 44	Produces all reports. Also, default for not supplying any other options is the production of all reports.
SUMMARY	After 44	Produces Spindle and Pack Summary Reports.
DETAIL	After 44	Produces Detail Report (PCN (PCN SQ038-R02) only.
SPINDLE	After 44	Produces Spindle Report (PCN SQ038-R01) only.
PACK	After 44	Produces Pack Report (PCN SQ038-R03) only.
;	44 or After	Must be present and delineates end of format.
EKM3FO CARD FORMAT 2	POSITION	INSTRUCTIONS
PRINT INTERVAL = HH.TTT	1-23	Allows optional printing of detail lines on the Detail Report at specified intervals. The default is the sample time interval used by EKM1FO divided by 3600.
;	24	
		Must be present and delineates end of format.

EKM3FO CARD FORMAT 3	POSITION	INSTRUCTIONS
NODUPS	1-6	Causes suppression of identical print lines in the Detail Report (PCN SQ038-R02).
;	7	Must be present and delineates end of format.

3.2.1.3 EKM4FO. Input to this program consists of parameters specifying configuration of packs and their numbers.

EKM4FO CARD FORMAT 1	POSITION	INSTRUCTIONS
FIXED	1-5	Entered if data on all configured PERM disk is required. This card, if used, must be input by itself to the first activity of a job. If removable disk pack data is desired, additional activities of EKM4FO are required.

EKM4FO CARD FORMAT 2	POSITION	INSTRUCTIONS
FIRST	1-5	If data is being collected on removable packs only, this parameter card is used in the first activity followed by format 4 cards.

EKM4FO CARD FORMAT 3	POSITION	INSTRUCTIONS
NEXT	1-4	This card is entered as the first parameter in succeeding activities to flag additional processing. This card is then followed by format 4 cards.

EKM4FO CARD FORMAT 4	POSITION	INSTRUCTIONS
AAAAA	1-5	This format specifies the removable pack to be analyzed. Alphanumeric pack names must be entered in cc 1-5 and must correspond to \$NNNPK cards specified within this activity to mount the desired pack. As many of these cards may be specified per activity as there are removable spindles on the system. Multiple activities require cards with this format

EKM4FO CARD FORMAT 4

POSITION

INSTRUCTIONS

to be preceded with card
format four.

3.2.1.4 EKM5FO. Input consists of six different card formats. The program will accept the parameter cards in any order. All options must be separated by a comma. An "*" is used as a delimiter for each input card. Paragraph 3.2.4 of this manual should be carefully read and the outputs examined before preparing input parameters for this program. Input formats are as follows:

EKM5FO CARD FORMAT 1

POSITION

INSTRUCTIONS

REPORTS-

1-8

Any combination of desired reports may be selected. The following is a list of key words and the PCN reports they generate:

ALERT

After 8

Produces only Alert List (PCN SQ038-R04).

PERM

After 8

Produces only Perm Disk Utilization Summary (PCN SQ038-R05).

REMOVABLE

After 8

Produces only Removable Disk Utilization Summary (PCN SQ038-R06).

DISK STATUS

After 8

Produces only H6000 Disk Status Summary (PCN SQ038-R07).

UMC

After 8

Produces only List of User Master Catalogs (PCN SQ038-R08).

*

Variable

Must be present and delineates end of format.

Any or all of the options may be specified, but a comma is required to separate the options. An asterisk is required following the last option specified to indicate that all the reports desired have been entered. Default is generation of all reports.

EKM5FO CARD FORMAT 2	POSITION	INSTRUCTIONS
INTERVAL-	1-9	This parameter allows the time period to be specified for PCN SQ038-R04 and PCN SQ038-R05.
PERM=NNN	After 9	"N"s in the format should be filled with two- or three-digit integers, specifying the number of days under investigation. ALERT integer range is between 30 and 365. PERM integer range is between 15 and 365. Default is 30 days for both reports. A comma is required to separate options.
ALERT=NNN	After 9	
*	Variable	Must be present and delineates end of a parameter card.
EKM5FO CARD FORMAT 3	POSITION	INSTRUCTIONS
DISK STATUS-	1-12	This card is required when the option for PCN SQ038-R07 is specified. These parameters must be specified by the user, since these values are not calculated within the program and have no default values.
AVAILABLE LLINKS=NNNN	After 12	Total number of llinks available on the system. Calculated by multiplying the number type of disk configured as PERM by the capacity of the units in llinks.
SYSTEM FILES=NNN	After 12	Total number of llinks used by GCOS. Available from a GCOS loadmap.
WORK AREA=NNN	After 12	Total number of llinks set aside for temporary working files.
*	Variable	Must be present and delineates end of a card input.

EKM5FO CARD FORMAT 3

POSITION

INSTRUCTIONS

The above numeric fields are limited to a maximum of eight digits. They must be separated by commas. If required, they can be on separate cards with DISK STATUS- preceding the desired input.

EKM5FO CARD FORMAT 4

POSITION

INSTRUCTIONS

COMMANDS-CC=AAAAAA

1-9

This card is used to associate a command code to an expanded literal for reporting purposes. Standard command codes are outlined in AFM 171-100, Volume II, as the first two characters in a USERID.

CC=AAAAAA

After 9

The command code should replace the "CC" characters of this format. The literal for the command can be a maximum of six characters and follows the equal sign. A maximum of 20 command literal associations are possible. They must be separated by commas. The last entry must be followed by an asterisk. Default places all command totals under the same labeled category (miscellaneous).

NOTE: Command codes should be associated with a literal to enhance clarity of the reports.

*

Variable

Must be present and delineates the end of the parameter card.

EKM5FO CARD FORMAT 5

POSITION

INSTRUCTIONS

STAFF AGENCIES-

1-15

This card is used to substitute an organization name for USERID on PCNs SQ038-R06 and SQ038-R07. Up to 200 unique associations may be made, but each should be followed by a comma and an asterisk should signify the last entry on an input card. The default is characters 3-6 of the USERID for organization name.

EKM5FO CARD FORMAT 5	POSITION	INSTRUCTIONS
AAAAAA=XXXXXX	After 15	The first five characters of a UMC replace the "A"s. A staff office code between two and six characters replace the "X"s. If less than six characters are used, blanks will be in the remaining positions.

NOTE: Study examples in paragraph 3.2.4 before utilizing this option.

EKM5FO CARD FORMAT 6	POSITION	INSTRUCTIONS
UNIQUE UMC-	1-11	This card is used to associate nonstandard UMCs with a standard USERID. Standard USERIDs are covered in AFM 171-100, Volume II.
UUUUUU=AAAAAAAAAAAA	After 11	In the format, the "U"s should be replaced with the first five letters of the standard USERID. The "A"s should be replaced with the nonstandard USERIDs, which may vary from two to 12 characters in length. Nonstandard USERIDs are then separated by a comma with the last nonstandard USERID followed by an asterisk. Up to 200 UMC associations are possible.

* Variable Must be present and delinates the end of parameter card.

3.2.1.5 EKM6FO. No staff inputs are needed to execute this program.

3.2.1.6 EKM7FO. No staff inputs are needed to execute this program.

3.2.1.7 EKM8FO. Input to this program consists of one or more parameter cards which allow user selection of device records for processing. The formats are as follows:

EKM8FO CARD FORMAT 1	POSITION	INSTRUCTIONS
PERM*	1-5	If more than one type resides on the system, the types (180, 181, 190, 191, 451) must be entered beginning in column 9 separated by a comma.

EKM8FO CARD FORMAT 1	POSITION	INSTRUCTIONS
		NOTE: If this card is used it must be the first input card.
EKM8FO CARD FORMAT 2	POSITION	INSTRUCTIONS
RMVBL*	1-6	Use this parameter to map removable packs. The number of packs to be mapped should replace the N"s. No delimiter is required. This card is followed by input from card format three.
NNN	9-12	
EKM8FO CARD FORMAT 3	POSITION	INSTRUCTIONS
XXXXXX	1-5	The "XXXXXX"s should be replaced with a pack name and the "TTT"s with the type of pack. The number of cards with this format must be the same number as entered on card format two.
TTT	9-11	

3.2.2 COMPOSITION RULES. All parameters should start in card column one unless otherwise specified. Grammatical rules and punctuation that must be observed in order to prepare input are covered by parameter card in paragraph 3.2.1.

3.2.3 INPUT VOCABULARY. NA.

3.2.4 SAMPLE INPUTS. Sample inputs are presented in this section for each program.

3.2.4.1 THE REMOVABLE DISK PACK MONITOR (EKM1FO).

a. Parameter Inputs. After initiation of the JCL found in AFM 171-606, Volume I, GCOS will ask for privity to be granted. After privity is granted the following message will print on the console:

- - - EKM1FO IN EXECUTION - - - ENTER SAMPLE TIME (NN SECS, 15 to 99)

The operator will then input a value from 15 to 99. The input sample interval is the time between snapshots of the SCT. Records will be written to the SCF according to this parameter. The user must also provide the time of day when the operator should terminate the monitor.

3.2.4.2 THE REMOVABLE DISK PACK DATA REDUCTION (EKM3FO).

a. Parameter Inputs. A maximum of 10 different time intervals with the three following reports are possible per XSCF tape: Spindle Summary (PCN SQ038-R01), Detail By Spindle (PCN SQ038-R02), and Summary By Device Type (PCN SQ038-R03). The absence of any parameter cards will

cause production of all reports covering every record contained on the XSCF tape. The following are examples of the parameter cards:

(1) In the example below all three reports will be generated for records from 00.000 24.000 hours on 16 Mar 79. NODUPS will cause suppression of duplicate lines of print.

Example:

INCLUDE FROM 790316/ TO 790417;
NODUPS;

(2) In the example below the Spindle Report (PCN SQ038-R01) and the PACK Report (PCN SQ038-R03) will be produced for all records on 3 Mar 79 from 0930 to 1700.

Example:

INCLUDE FROM 790316/09.500 TO 790316/17.000 SUMMARY;

(3) In the example below only the Detail Report (PCN SQ038-R02) will be produced on records from 1700 on 16 Mar 79 to 2400 on 17 Mar 79. The PRINT INTERVAL option has been used and will cause details line on the Detail Report to be printed every three minutes.

Example:

INCLUDE FROM 790316/17.000 TO 790317/24.000 DETAIL;
PRINT INTERVAL=00.050;

(4) In the example below all reports are produced on all records contained on the XSCF tape. Duplicate print lines are suppressed on the Detail Report (PCN SQ038-R02), since the NODUPS option is used. Also, the print interval will default to sample time of EKM1FO divided by 3600.

Example:

NODUPS;

3.2.4.3 THE CATALOG/FILE DESCRIPTOR MONITOR (EKM4FO).

a. Parameter Inputs. Multiple sets of parameter cards and JCL may be required to examine large removable pack populations. The maximum number of removable packs to be interrogated per activity is limited to the number of removable spindles on the system. \$ NNNPK cards must be present within the activity for each removable pack to be examined in that activity. Each requested pack within an activity must have a unique file code; such as, AA, BB, CC, DD, etc. There are four parameter card formats. The following are examples of their use:

(1) This format must be in a separate activity as the only input.

The following will generate data on PERM files:

Example:

FIXED

(2) The parameter "FIRST" is used in the first activity of runs collecting only information on removable packs. A flag is set signaling the monitor that this is the first activity of a job collecting information on removable packs; succeeding cards specify packs to be examined in the first activity.

Example:

FIRST
DP001
DP002
DP003

(3) The parameter "NEXT" is used with each subsequent activity which examines removable packs. It is also followed by cards specifying packs to be examined.

Example:

NEXT
DP004
DP005
DP006
DP007

3.2.4.4 BASIC UTILIZATION REPORT PROGRAM (EKM5FO).

a. Parameter Inputs. The six input formats which provide the user control over report selection are described in the following:

(1) In this example, card format one has been used to request the PERM Disk Utilization Summary (PCN SQ038-R05), Removable Disk Utilization Summary (PCN SQ038-R06), H6000 Disk Status Summary (PCN SQ038-R07), List of UMCs (PCN SQ038-R08).

Example:

REPORTS-PERM,DISK STATUS,UMC,REMOVABLE*

(2) In this example, the "INTERVALS" parameter card has been used to set the interval of investigation on the Alert List (PCN SQ038-R04) to 90 days and the interval on the PERM Disk Utilization Summary to 60 days.

Example:

INTERVALS-PERM=60,ALERT=90*

(3) In this example, card format three is used to input three values, which the user must supply to produce PCN SQ038-R07. Total available llinks on the system has been entered as 258,000, the amount of space used by system files is 48,000 llinks, and temporary work space has been set at 99,500 llinks.

Example:

DISK STATUS-AVAILABLE LLINKS=258000,SYSTEM FILES=48000*
DISK STATUS-WORK AREA=99500*

(4) In this example, card format five provides command breaks for PCN SQ038-R05, PCN SQ038-R06, PCN SQ038-R07, and PCN SQ038-R08. It also provides a command name to be substituted for command code for report purposes.

Example:

COMMANDS-FO=DSDC,FK=AU*

(5) In this example, card format six provides names which are substituted for organizational totals in PCN SQ038-R05 and PCN SQ038-R06.

Example:

STAFF AGENCIES-FKCSC=ACSC,FKAIC=AI/FOS*
STAFF AGENCIES-FOPGC=PHASE4*
STAFF AGENCIES-FKRTC=ROTC,FOSDT=SDS,FKLMD=LMD*

(6) In this example, card format seven is used to associate nonstandard USERIDs to standard USERIDs. This allows all the attributes of a nonstandard USERID to be accumulated under a specified UMC.

Example:

UNIQUE UMC-FOPRD=WORD-PROC,SARA-H,TAPELIBR*
UNIQUE UMC-FOSDM=SWAP,FOSDAA,DATAMGT,PSOLUS,SYSLIB*

3.2.4.5 THE DISK INTERVAL UTILIZATION PROGRAM (EKM6FO).

- a. No parameter inputs are required.

3.2.4.6 THE DISK PACK CATALOG/FILE DATA REDUCTION PROGRAM (EKM7FO).

- a. Parameter Inputs. Parameter inputs are not required for this program.

3.2.4.7 THE DISK MAP PROGRAM (EKM8FO).

- a. Parameter Inputs. Inputs to this program specify which devices on PERM or which removable packs are to be mapped.

(1) In the following example the user has specified for all 181 and 451 PERM disk to be mapped, along with two removable packs for each of these type devices:

Example:

```
PERM* 181,451
RMVBL* 4
DP001 181
DP002 181
DP003 451
DP004 451
```

(2) In the following example the user has specified that only the PERM disk be mapped:

Example:

```
PERM*
```

(3) In the following example the user has specified that only two removable packs be mapped:

Example:

```
RMVBL* 2
DP001 451
DP002 191
```

3.3 OUTPUT REQUIREMENTS. Output requirements vary depending on the purpose and the amount of data the user has chosen to examine. The two monitors, EKM1FO and EKM4FO, generate data records. These records are then input into the appropriate data reduction program for desired reports. The use of these reports is discussed in detail in paragraph 3.4.

3.3.1 OUTPUT FORMATS.

3.3.1.1 PCN SQ038-R01, SPINDLE SUMMARY REPORT. (See figure 3-1) This report provides a summarized list, by spindle type and name, of the number of packs mounted, allocated time (time pack was mounted and user files were open), and percent of time that a spindle was allocated over a time interval. The number of spindles available for assignment by the peripheral allocator during the sample period is shown in the upper right-hand corner of the report. The trailer contains information about the sequence of produced reports. "SECTIONS" correspond to the order and number of reports within the requested intervals. "PART" corresponds to the different types of devices included within the report.

3.3.1.2 PCN SQ038-R02, DETAIL BY SPINDLE REPORT. (See figure 3-2) This report provides a detailed look at activity occurring on each spindle configured for removable packs. Directly under each spindle name the

status is shown by the columns "PACK" and "USAGE". Under the "PACK" column a spindle may be assigned waiting for a pack (shown by "A:DPNNN"). The spindle may be empty and unassigned shown by "OPEN" or it may have a pack mounted shown by the pack name. The "USAGE" column shows the number of user files open. Asterisks are printed beside the usage counts that have only status connects attributed to user's files. The trailer format corresponds to the trailer description in paragraph 3.3.1.1.

3.3.1.3 PCN SQ038-R03, SUMMARY BY DEVICE TYPE. (See figure 3-3) This report provides a list of all the packs mounted during the monitored time. Information displayed on each pack is the number of times the pack was mounted, the total time the pack was mounted on a spindle, the allocated time (time a pack was mounted that a user file was open), and percentage of time the user had files allocated the total mounted time. Also, the number of status connects divided by allocation percent are shown giving the percent of allocated time that only status connects were occurring to the pack.

3.3.1.4 PCN SQ038-R04, ALERT LIST. (See figure 3-4) The report provides a list by UMC of catalog file strings that have not been accessed for a specified number of days. The "AS OF" date is the date the data base was collected. The "ACCESS SINCE" date is used to determine what catalog file strings are to be listed. It is computed by subtracting the number of days indicated on card format two of EKM5FO from the "AS OF" date. Across from the catalog file strings are the file attributes of each individual file. "CREATION DATE" is the date the file was created. "LAST DATE ALLOCATED" is the last date the file was accessed. "MAXIMUM NO. LLINKS" is the maximum number of llinks the user allows for a file. If a file has unlimited file space, an "UNLMTD" is shown. Current file size is shown under "CURRENT NO. LLINKS". The total number of times a file has been allocated since its creation is shown under "NUMBER OF ALLOCATES".

3.3.1.5 PCN SQ038-R05, PERM DISK UTILIZATION SUMMARY. (See figure 3-5) The report provides a summary of the PERM disk usage. The "AS OF" date shows the date the data base was collected. The UMCs along with their attributes are listed. The maximum amount of space allowed for user's files is shown under "LLINKS ASSIGNED". A "+" next to the column indicates unlimited file space available to that UMC. The actual amount of space used is shown under "LLINKS ALLOCATED". The "PERCENT ALLOCATED" is the percentage of total space available that is actually occupied by files. The "SINCE" data is computed by subtracting the number of days entered on card format two from the "AS OF" date. The "PERCENT USED" column shows the percentage of total llinks allocated that have been used after the "SINCE" date. The "ACTIVE LLINKS" is the total amount of space that has been accessed after the "SINCE" date. Cumulative totals, if desired, are available by a UMC, staff organization and command. The line highlighted by the "*" is the totals for the staff agency. The line highlighted by the "*****" is the totals by command. Miscellaneous and system totals are given at the end of the report. Additional information is available in paragraph 3.3.2.2 about the totals breakdown for commands and staff organizations.

3.3.1.6 PCN SQ038-R06, REMOVABLE DISK UTILIZATION SUMMARY. (See figure 3-6) The report provides summary information about removable disk packs. The UMCs are listed with the pack name and the amount of space occupied by the users' files. The activity of the files is also broken down among three usage periods showing the number of active little links. To the right of this is an organization summary of the space and activity for each period. Under the broken line, staff organizations are found where the same UMCs are associated to one staff office. Card format six, paragraph 3.2.1.4, is used to associate unique UMCs to a standard UMC. The default is to group the UMCs together into a miscellaneous category for organization, command, and system totals. Card format four, command association input, will cause identical UMCs to be grouped together and organization totals given using character three through five of the UMCs as the organizational symbol. Command totals will then follow for all applicable UMCs. Other UMCs will be grouped into the miscellaneous category for organization and command totals.

3.3.1.7 PCN SQ038-R07, H6000 DISK STATUS SUMMARY. (see figure 3-7) This report provides a summary of the file space on the system and how it is being used. File space is divided into three categories: "ASSIGNED", "ALLOCATED" and "AVAILABLE". Under these categories is the "PERCENT ALLOCATED" which is the percent of the assigned file space which is allocated. If card format four, command association input, is used, the totals will be given for each category by command. Otherwise, all file space statistics will be grouped as miscellaneous.

3.3.1.8 PCN SQ038-R08, LIST OF USER MASTER CATALOGS. (See figure 3-8) The report provides a list of all UMCs with assigned file space. The "AS OF" date is the date the data base was collected. The report shows "LLINKS LIMIT" which is the maximum space allowed for the UMC's files. A UMC with unlimited file space will have the current space occupied followed immediately by a "+". The "CURRENT LLINKS" is the space occupied by the files of the UMC. The "FMS OVERHEAD" is the amount of space required by FMS to manage the file structure. If card format four, command association input, is used, the totals will be given for each command. Otherwise, all UMC statistics will be grouped as miscellaneous. Also, any unique UMCs must be associated with a standard UMC on card format six, unique UMC association, or all unique UMCs will be grouped as miscellaneous.

3.3.1.9 PCN SQ038-R09, OLD FILES DELETED. (See figure 3-9) The report provides a list of catalog/file strings deleted between two executions of the catalog/file descriptor monitor (EKM4FO). The "AS OF" date is the date of collection for the latest data base. File attributes are also given as shown by the column headings. Spaces under "NUMBER OF ALLOCATES" indicate zero allocates.

3.3.1.10 PCN SQ038-R10, NEW FILES CREATED. (See figure 3-10) The report provides a list of catalog/file strings created between two executions of EKM4FO. The "AS OF" date is the date of collection for the latest data base. File attributes are also given as shown by the

column headings. Spaces under "NUMBER OF ALLOCATES" indicate zero allocations.

3.3.1.11 PCN SQ038-R11, PACK ALLOCATION REPORT. (See figure 3-11) The report provides a summary for both removable and fixed files creation. Fixed devices are grouped together and shown under "DEVICE" as "FIXED". For removable, the pack name is given under the "DEVICE" column. The "MONTHLY ALLOCATION RATE" is given for fixed and each pack. "CURRENT NUMBER LLINKS" is the amount of file space occupied on the device. "MAXIMUM NUMBER LLINKS" is the amount of file space that would be occupied if all files on the device grew to their maximum size. "NUMBER OF UNLIMITED FILES" is the number of files that can grow to the maximum allowed to the UMC.

3.3.1.12 PCN SQ038-R12, CATALOG ALLOCATION REPORT. (See figure 3-12) The report provides a statistical summary of usage by UMC subdivided into level one catalogs. The "FILE CREATION DATES" heading shows the creation date of the earliest and latest files in the data base. The UMC along with any level one catalogs, if applicable, is given. Statistics for quick access files for a UMC will be indicated by spaces under the "LEVEL-1 CATALOG" heading. A Clink rate along with current and maximum number of llinks is also given.

3.3.1.13 PCN SQ038-R13, FILE ALLOCATION REPORT. (See figure 3-13) The report provides by catalog file string a monthly allocation rate for each file. The "FILE CREATION DATES" heading shows the dates from the oldest file to the most recent. The files are listed according to the monthly allocation rate in descending order. In adjacent columns the file's current and maximum file size is given. The "DEVICE" column indicates where the file is located. If the file is occupying permanent space, "FIXED" will be printed. Otherwise, the pack name for the file will be listed.

3.3.1.14 PCN SQ038-R14, DISK MAP. (See figure 3-14) This report provides an absolute location map of files contained on either fixed or removable devices. The heading indicates which device is being mapped. "CYLINDER NUMBER", "STARTING LLINK", "ENDING LLINK" and "FILE SIZE" are shown. Adjacent to these columns is the catalog file string for each file.

3.3.1.15 PCN SQ038-R15, PARAMETER CARD ERROR LIST. (See figure 3-15) The report is a list of the parameter cards entered into EKM5F0. If a parameter card is in error, a message will be given immediately below it.

3.3.1.16 PCN SQ038-R16, INPUT RECORDS/PARAMETER CARDS INFORMATION. (See figure 3-16) This report is produced by EKM3F0. The first line provides information about the tape number, dates/times of the information on the tape. Under "PARAMETER CARDS" is a list of the input cards with error messages immediately following. Under "TIME INTERVAL ANALYSIS" a breakdown of start-stop dates/times is given for each report. After the interval analysis, the "PRINT INTERVAL" used to generate the Detail Report is given. Next is the print suppression

option used for the Detail Report. The "NODUPS IS F" statements indicate no suppressing of printing while "NODUPS IS T" indicates there was suppressing of duplicate print lines. Any date/time group requested outside the available data on the tape will be listed next.

3.3.1.17 PCN SQ038-R17, ERROR LIST. This report is produced by EKM7F0. The error messages are explained in paragraph 3.5.2.5.

3.3.1.18 PCN SQ038-R18, PARAMETER CARDS/ERROR LIST. This report lists the input parameter cards of EKM8F0 along with any associated errors. The errors are explained in paragraph 3.5.2.6.

3.3.1.19 PCN SQ038-R19, INPUT PARAMETER CARDS LIST. This report lists the input parameter cards of EKM4F0 along with any associated errors. The errors are explained in paragraph 3.5.2.2.

3.3.1.20 PCN SQ038-R20, DATA BASE COMPARISON ERROR LIST. This report shows how many files were excluded from processing because of an invalid file creation date.

3.3.2 SAMPLE OUTPUTS. Samples in this section of the manual have been chosen to highlight print options or unusual events that might surface in the reports. Other reports not covered in this section have sufficient explanation given in paragraph 3.3.1.

3.3.2.1 PCN SQ038-R02, DETAIL BY SPINDLE. Figure 3-1 shows an example of the Spindle Summary Report. The box on the right-hand side contains statistics for all removable 181 spindles during the specified time period. The "% TOTAL TIME" is the percent of time during the interval the corresponding number of spindles was available. For example, there was one spindle available 5.37% of the time while two spindles were available 22.59% of the time.

3.3.2.2 PCN SQ038-R05, PERM DISK UTILIZATION SUMMARY. Figure 3-5 shows partial output resulting from parameter cards used in figure 3-16. The "UNIQUE UMC" card is used to associate the unique UMCs (SWAP, PSOLVS and SYSLIB) to the standard UMC (FOSDM). The "STAFF AGENCIES" card is used to substitute DX22 for the staff organization totals. Otherwise, totals for the staff organization would be listed as SDM. Notice, the default for not using the "STAFF AGENCY" card is characters 3-6 of the UMC as in the XOT totals. The totals by command are given at the bottom of the page. To receive these totals the "COMMANDS" input parameter card must be used. Figure 3-17 shows the category in which all nonstandard User Master Catalogs not associated with standard User Master Catalogs are summarized. This summary will always appear just before the system totals.

3.3.3 OUTPUT VOCABULARY. NA.

3.4 UTILIZATION OF SYSTEM OUTPUTS. There is no single method of deducing "optimum disk performance" from DIANA reports. The reports provide information which, when combined with the disk manager's knowledge of the specific system monitored, allow insight to the disk

system's performance under the site's workload. If there are obvious "bottlenecks" in the system, such as inactive or misplaced files causing an imbalance of PERM to removable files, DIANA will provide a strong indication of which files are causing the problem. The following paragraphs list by PCN some areas to consider within each report.

3.4.1 SPINDLE SUMMARY REPORT. PCN SQ038-R01 summarizes the physical mounts, allocation time attributed to each spindle, and provides the percent of monitored time that a spindle is not available. Highlighted in the upper right-hand corner of the report is a parameter showing the number of spindles available for assignment by the peripheral allocator. The following conditions within this report indicate a need for additional investigation:

a. Large numbers of pack mounts should cue the disk manager that trend analysis should be performed.

b. Very few spindles available for allocation during the monitored time indicate that further investigation of the removable spindle system is necessary. Additional monitoring is warranted and utilization of the trend analysis portion of DIANA should be considered.

c. If saturation of the spindles appears only during specific time periods, rescheduling of some of the jobs requiring pack mounts should be considered.

3.4.2 DETAIL BY SPINDLE REPORT. PCN SQ038-R02 furnishes a time-sequenced spindle map of packs mounted and packs temporarily assigned by the peripheral allocator. The number of files open on a pack (usage) is displayed by each mounted pack, and an asterisk is displayed next to packs having files which are open with only status connects attributed to them. Multiple spindle maps will be produced for systems having more than eight removable spindles. Examination of this report can pinpoint problems surfaced by summary reports. The following conditions could provide insight into problems occurring within the system:

a. Pack numbers which are frequently mounted and appear on different spindles each time could indicate that a conscious effort should be attempted to schedule batch jobs requiring a certain pack during the same time. Also, when a pack is called for within a job stream, care should be taken to insure that the public option on the \$NNNPK card is used. This will allow multiple users on that pack when it is mounted and will decrease mounts and peripheral allocator overhead.

b. Packs with open files that show an asterisk beside them for long periods of time could indicate that further investigation by the disk manager and the user is warranted. Optimization of job scheduling or the JCL could decrease the monopolizing of that spindle by the pack identified and free the spindle for other users.

3.4.3 SUMMARY BY DEVICE TYPE. PCN SQ038-R03 summarizes (by pack number) the physical mounts, mounted time, allocated time (time at least one

file was open to the pack), and shows the percentage of mounted to allocated time for each pack during a monitored interval. The following conditions usually surface problem areas for disk managers:

a. Packs having large number of mounts generally indicate that high activity files reside on those packs which require research to identify high use files that should be moved to PERM.

b. Packs with high allocation time could be candidates for the same process described in (a) or possibly an optimization technique of combining packs having high allocation times.

c. Packs with low allocate/mount percentages are also candidates for file optimization. Investigation of this and the other conditions mentioned can be accomplished more thoroughly using the Detail by Spindle Report.

3.4.4 ALERT LIST. PCN SQ038-R04 is produced by EKM5FO and is initiated, as are other reports created by this program, for the purpose of providing the disk manager information with which to establish day-to-day control over disk resources. Information on inactive PERM files is displayed and summarized by USERID. These reports can be used in the following ways:

a. Listings pinpointing catalog/file strings that should be moved to other media can be sent to the various users. In most cases this aids the user in controlling their own PERM requirements.

b. Listings can be used in conjunction with the Honeywell File Management System (FMS) option "Since Restore" which automatically deletes files that have not been active since a certain date. The lists can be sent to the user to forewarn of files that will be removed on a certain date. This will allow the user ample time to access that file if it is indeed useful. Sites electing to use this option can insure that inactive files will not waste PERM space.

3.4.5 PERM DISK UTILIZATION SUMMARY. PCN SQ038-R05 is produced by EKM5FO as discussed in paragraph 3.4.4. Information on utilization of PERM disk is displayed by USERID, showing accumulated totals listed by organization and system levels. This report is useful in monitoring the following:

a. Utilization of assigned space (approved amount of PERM space to which a user may assign files) can be controlled by scrutinizing the percent allocated column of the report. Users with continual percentages below the 75% level should be investigated to find out if their requirements are still valid. If the requirement is no longer valid, that space can be allocated to another purpose.

b. Activity of existing files can be determined by monitoring the percent used and active llinks columns of the report. These columns provide the disk manager with means to determine if the user is appropriately assigning files to the correct media. Continual

percentages below the 75% level indicate the user should choose other media for some files. Identification of these files can be accomplished by using the trend analysis portion of DIANA.

3.4.6 REMOVABLE DISK UTILIZATION SUMMARY. PCN SQ038-R06 is produced by EKM5FO to provide the disk manager information with which to monitor removable disk pack assignments. This report provides the total number of LLINKS residing on a specific pack, displayed by activity periods and summarized by USERID, organization, and system. The following conditions usually indicate problem areas:

a. Packs having a large number of blocks accessed within a 30-day period should be investigated using the Removable PACK Monitor (as indicated in attachment 1) to determine if a problem exists. If a problem does exist, optimization of file placement should be initiated using periodic trending techniques to identify files which should be considered for placement on PERM disk.

b. USERIDs or organizations with multiple packs containing large amounts of unused file space should be combined on one pack.

c. Packs with high amounts of inactive space; i.e., files inactive over 90 days, are candidates for transfer to magnetic tape.

3.4.7 H6000 DISK STATUS SUMMARY. PCN SQ038-R07 is produced by EKM5FO and provides an overview of the use of PERM space by the system in summarized form. This report displays space used by system files, and by separate commands and provides a breakdown of the space allocated for work area (temporary files). The following conditions usually indicate problem areas:

a. Large amounts of available disk generally indicate users have requested more space than actually required, or that past justifications for previous projects are no longer valid. In either case, further investigation is warranted.

b. Systems continually having an abundance of temporary files could allocate more space to PERM or reconfigure and add an additional removable spindle. Care should be exercised in these measures, however, and "minimum work area available" peaks should be checked out using the SYRUP monitor. SYRUP information should provide the disk manager with the optimum amount of space by which to reduce the work area.

3.4.8 USER MASTER CATALOG REPORT. PCN SQ038-R08 is produced by EKM5FO to provide information which will allow the disk manager to effectively evaluate requests for PERM space. This report lists the UMCs and displays maximum limit, current space used, and space used by catalog pointers to that UMC. The UMCs are then summarized by command to which they are assigned. This report is useful to:

a. Determine if user PERM space requirements are current.

b. Identify USERIDs with excessive FMS overhead.

c. Keep track of the systems PERM space assigned.

3.4.9 OLD FILES DELETED REPORT. PCN SQ038-R09 is automatically produced when the user chooses to perform trend analysis with EKM6FO. This report contains a list of files which have been removed during the selected time interval. Examination of this report and comparison with PCN SQ038-R10, New Files Created Report, can reveal trends in user activity.

3.4.10 NEW FILES CREATED REPORT. PCN SQ038-R10 is identical to the Old Files Deleted Report except that it is a list of files created during the trend analysis period selected.

3.4.11 PACK ALLOCATION REPORT. PCN SQ038-R11 provides accumulated totals by pack on parameters needed to identify problem areas for periodic trending. The following conditions indicate areas for further investigation:

a. Packs with high monthly allocation rates generally indicate high activity files residing on that pack, which causes high contention for removable spindles. Further investigation of the reports within EKM7FO should identify files which should reside on PERM.

b. Packs which have a low number of current LLINKS and high monthly allocation rates are also identified. Combining of these packs with other removable user's packs could possibly reduce the number of physical packs on the system and increase the odds of concurrent usage to that pack, thereby increasing system efficiency and decreasing spindle contention.

3.4.12 CATALOG ALLOCATION REPORT. PCN SQ038-R12 provides information on level one catalogs which will aid the disk manager in deciding which catalogs are candidates for removable or PERM media. Because of the methodology associated with the Honeywell job structure it is not always possible to separate files within a catalog. Moving one file does not always eliminate unnecessary pack mounts. Therefore, entire catalogs may have to be moved to insure a reduction in pack mounts. This report displays a calculated activity to file size (CLINK) rate for each catalog. CLINK rates for catalogs with the same space requirement can be compared. Those with higher rates should be considered the better candidates for transfer to PERM spindles. There are exceptions to this rule concerning files which are allocated during long intervals of time. This condition is generally known by the disk manager and the files are usually already assigned to PERM. The small percentage of these files which do exist on packs can be identified with continued runs of DIANA following the transfer of previously identified candidates for PERM. Dealing with these will require further analysis using EKM8FO and GMF.

3.4.13 FILE ALLOCATION REPORT. PCN SQ038-R13 furnishes the disk manager a list of files sorted by monthly allocation rate. Files that are allocated more often appear at the front of the list and inactive files at the back. Removable candidates can be identified by noting files with the higher allocation and reviewing the "PACK" column of the report

which indicates the pack on which they reside. The inactive files will be displayed with zero rates and 'FIXED' will be printed in the pack column. If an imbalance is noted, the other reports from EKM7FO should be examined to determine if only certain files, catalogs, or entire packs should be converted to other media. The disk manager should examine the purpose of these files with users before any action is taken.

3.4.14 DISK MAP. PCN SQ038-R14 provides the user a list by catalog/file string of the current location of files on PERM or removable disk. This report can provide in-depth knowledge of files when used in conjunction with the Specific File Report contained in the Mass Store Monitor of the GMF.

3.5 RECOVERY AND ERROR CORRECTION PROCEDURES. The error messages for each program module are recorded on formatted error listings for each occurrence. In order to minimize costly reruns, most errors are considered fatal and result in system termination. Exceptions to this rule are documented with each individual error message. Error correction is initiated by reexecuting the appropriate program/activity.

3.5.1 RECOVERY PROCEDURES. All recovery procedures are documented in AFM 171-606, Volume I.

3.5.2 ERROR CORRECTION PROCEDURES.

3.5.2.1 EKM3FO ERROR MESSAGES. These error messages are possible in report PCN SQ038-R16.

MESSAGE

REASON

ZERO TIME PERIOD

The two date-time groups on the "INCLUDE FROM" card are the same. Check the date-time groups to insure compliance with card format one, paragraph 3.2.1.2. If this condition is encountered, the input parameter card is ignored and processing continues.

YOUR PRINT INTERVAL OF NNN IS
LESS THAN THE SYSTEM INTERVAL
OF NNN. PRINT INTERVAL SET TO NNN.

A warning indicating the "PRINT INTERVAL" specified on card format two of paragraph 3.2.1.2 is less than the sample time entered for EKM1FO. The final statement shows what print interval was used for computations.

MESSAGE

REASON

NEGATIVE TIME PERIOD

The "TO" date-time group is less than the "FROM" date-time group on the "INCLUDE" card. Check to insure date-time groups are entered in the proper order. If this condition is encountered, the parameter card is ignored and processing will continue.

OVERLAPPING DATA/TIME RANGES

This message indicates multiple date-time groups overlapped on the "INCLUDE FROM" card of paragraph 3.2.1.2. Check the date-time groups for each card to insure they do not overlap and reexecute EKM3FO.

INVALID DATE

Include "FROM" or "TO" date is invalid. It did not pass the date edit check. Insure the date comply with paragraph 3.2.1.2 and reexecute EKM3FO.

INVALID TIME

The "INCLUDE FROM" or "TO" time is invalid. It did not pass the time edit check. Insure the times comply with paragraph 3.2.1.2 and reexecute EKM3FO.

INVALID FORMAT

This message is given for a variety of editing checks. Semicolon (;), slash (/), or "TO" missing from card format one of paragraph 3.2.1.2 will cause the message. Also, this error will be given if the number of "INCLUDE FROM" cards is greater than 10. Correct the errors and reexecute EKM3FO.

INVALID PRINT INTERVAL

The print interval specified exceeds 24 hours. Make corrections and reexecute EKM3FO.

INVALID REPORT OPTION (NOT SPINDLE, PACK, DETAIL, ALL OR NONE)

Only options under card format 1, paragraph 3.2.1.1 are allowed. Check to insure options specified comply with this paragraph and reexecute the job.

MESSAGE

INVALID OPTION (NOT INCLUDE FROM,
PRINT INTERVAL OR NODUPS)

INTERVAL YYMMDD/HH.TTT TO
YYMMDD/HH.TTT OUTSIDE RANGE OF TAPE

NO TYPE 732 RECORDS

NO PACK MONITOR RECORDS FOUND

3.5.2.2 EKM4FO ERROR MESSAGES. These error messages are possible in re-
port PCN SQ038-R19.

MESSAGE

FIRST CARD NOT FIXED, FIRST OR NEXT

NO PARAMETERS INPUT

NO REMOVABLE PACK NAME CARD FOUND

NUMBER OF UMCS ON SYSTEM EXCEEDS 500

SYSTEM CONFIGURATION TABLE ERROR

REASON

The input card does not comply
with any card formats in paragraph
3.2.1.2. Make changes and
reexecute EKM3FO.

The selected date-time intervals
are outside the range of the input
data tape. Make corrections and
reexecute EKM3FO.

The message indicates no Type 732
expanded records were found on the
input tape. Insure the start-up
deck has been properly configured
and the Type 732 records are being
expanded by GSEP.

The message indicates no records
were found. Insure the start-up
deck has been properly configured
and the Type 732 records are being
expanded by GSEP.

REASON

The initial input parameter card
must contain the proper control
word (FIXED, FIRST or NEXT).

At least one input parameter card
must be included with each execu-
tion of this program.

At least one pack name card (card
format four) must be input if the
"NEXT" control word is specified.

System design will not permit pro-
cessing of greater than 500 UMCs.
If this problem occurs, report it
to AFDSDC/SCCA, AUTOVON 921-4021.

An error has been detected in a
GCOS system table. Report this
problem to AFDSDC/SCCA, AUTOVON
921-4021.

MESSAGE

REASON

NO UMC DATA FOUND

No UMC data on configured PERM disk is available. According to the GCOS system tables, permanent disk is not configured online. If problem persists, contact AFDSDC/SCCA, AUTOVON 921-4021.

3.5.2.3 EKM5FO ERROR MESSAGES. These error messages are possible in report PCN SQ038-R15.

MESSAGE

REASON

INVALID REPORT SELECTION

The card scan could not find one of the following: UMC, DISK STATUS, ALERT, PERM, or REMOVABLE. Insure only these parameters are on input card format one of paragraph 3.2.1.4.

INVALID OR MISSING DELIMITER
(,), (*)

The card scan could not find a "," between options or there was no "*" at the end of the card. This error is possible for all format cards of paragraph 3.2.1.3.

INVALID REPORT INTERVAL SELECTION

The card scan could not find either "PERM=" or "ALERT=" on card format two of paragraph 3.2.1.4.

INVALID PARAMETER CARD NAME OR
FORMAT

The card scan looking for either the suffix "s-" or "-" at the end of options such as "COMMANDS-" or "INTERVAL-". Make changes and reexecute EKM5FO.

NO "=" SIGN FOUND OR WONG NUMBER OF
INPUT CHARACTERS

The card scan expecting an "=" on the "COMMAND" and "UMC" association card. This error is also given if the improper number of characters are used on either side of the equal sign. Reference paragraph 3.2.1.4 for proper format.

ALERT LIST INTERVAL OUT OF RANGE

The alert range is less than 30 days and greater than 365.

MESSAGE

REASON

PERM UTILIZATION SUMMARY INTERVAL
OUT OF RANGE

The PERM Utilization Summary range is less than 15 or greater than 365.

INVALID STAFF CODE

The card scan expecting five characters followed by an "=" on the "STAFF AGENCY" card. Reference paragraph 3.2.1.4 card format five for proper format.

INVALID STAFF LITERAL

The card scan expecting at least two but not more than six characters following the "=" sign on the "STAFF AGENCY". For details see paragraph 3.2.1.4, card format five.

INVALID DISK STATUS NUMBER

The card scan expecting a number less than nine digits. For details see paragraph 3.2.1.4, card format three.

NO DISK STATUS WHEN REPORT
PCN SQ038-R07 REQUIRED

Card format three of paragraph 3.2.1.4 was expected because of the request for the Disk Status Report. Reexecute EKM5FO with this parameter.

INVALID OR NONEXISTENT PARAMETER
CARD NAME

The card scan is expecting one of the five card formats described in paragraph 3.2.1.4. The card associated with this message did not comply with any of these formats.

3.5.2.4 EKM6FO ERROR MESSAGES. These error messages are possible in report PCN SQ038-R20.

MESSAGE

REASON

***NO DATA ON OLD FILE

No input records were found on file code 11. Insure tape input is from a successful run of EKM4FO. If problem persists, contact AFSDC/SCCA, AUTOVON 921-4021.

MESSAGE

REASON

ERROR INVALID TAPE CREATION
DATE IN OLD DATA BASE

The first word of the first record contains an invalid date. This date is the data base creation date. If problem persists, contact AFSDSC/SCCA, AUTOVON 921-4021.

*** NO DATA ON NEW FILE

No input records were found on file code 12. Insure tape input is from a successful run of EKM4FO. If problem persists, contact AFSDSC/SCCA, AUTOVON 921-4021.

ERROR INVALID TAPE CREATION
DATE IN NEW DATA BASE

The first word of the first record contains an invalid date. This date is the data base creation date. If problem persists, contact AFSDSC/SCCA, AUTOVON 921-4021.

ERROR OLD/NEW FILE CODES
REVERSED

The date of the old data base is greater than the date of the new data base. Reverse the file codes 11 and 12 and reexecute the job.

ERROR P+D/NEW DATA GREATER
THAN CURRENT DATE

The data base creation date for either or both input files is greater than the current day. Insure EKM4FO executes properly and the current date with the computer is correct. If problem persists, contact AFSDSC/SCCA, AUTOVON 921-4021.

***NNN RECORDS SKIPPED ON OLD FILE
DUE TO INVALID FILE CREATION DATE

This message will be given for each execution of EKM5FO. It provides the number of records excluded from computation because of the file creation date being invalid.

***NNN RECORDS SKIPPED ON NEW FILE
DUE TO INVALID FILE CREATION DATE

This message will be given for each execution of EKM6FO. It provides the number of records excluded from computation because of the file creation date being invalid.

3.5.2.5 EKM7FO ERROR MESSAGES. These error messages are possible in report PCN SQ038-R17.

MESSAGE

NNN RECORDS WERE EXCLUDED FROM ALLOCATION REPORTS DUE TO INVALID FILE CREATION DATES

REASON

This message only prints when records were excluded because of date-editing checks for the file creation date.

NNN RECORDS WERE EXCLUDED FROM PACK ALLOCATION REPORT DUE TO TABLE SIZE LIMITATION

The message only prints when records were excluded because more than 100 packs are found on the input data base.

3.5.2.6 EKM8FO ERROR MESSAGES. These error messages are given in report PCN SQ038-R18.

MESSAGE

INVALID DISK DEVICE TYPE

REASON

Reference paragraph 3.2.1.7, EKM8FO, for valid PERM disk types and correct input format.

INVALID REMOVABLE DEVICE TYPE

Reference paragraph 3.2.1.7, EKM8FO, for valid removable disk types and correct input format.

EXPECTED (PERM*/RMBVL*) CARD FORMAT

PERM or removable control cards expected. Reference paragraph 3.2.1.7, EKM8FO, for correct format and instructions.

REMOVABLE PACK CARDS FEWER OR GREATER THAN SPECIFIED

The number of removable packs specified in the input parameters is not equal to the number of packs to be mapped. Reference paragraph 3.2.1.7, card formats two and three for instructions.

NUMBER OF PACKS OUTSIDE RANGE

The number of removable packs must be a number between one and 100 inclusive.

UNEXPECTED END OF FILE

At least one input parameter card must be included with each execution of this program.

PERM* CARD MUST PRECEDE RMBVL* CARD

If permanent disk types are to be mapped, then the PERM* card must be the first input parameter card.

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1 February 1980

MESSAGE

REASON

ONLY ONE RMBVL* CARD PERMITTED

Multiple "RMVBL" cards are not allowed. All removal disk names may be specified on a single parameter card.

ONLY ONE PERM* CARD PERMITTED

Multiple "PERM" cards are not allowed. One entry is sufficient for all permanent disk types.

PCN 50033-P01

SPINDLE SUMMARY

REMOVABLE PACK ACTIVITY 800115707.520 TO 800116703.048

DSU181 SPINDLES

SPINDLES	PACK MOUNTS	ALLOCATED TIME	% TOTAL TIME	ALLOC	SPINDLES AVAILABLE	% TOTAL TIME
RP1	5	11.106		56.87		
RP2	7	11.765		60.24		
RP3	12	10.036		51.39	0	6.36
RP4	2	12.511		64.06		
RP5	7	8.351		42.76	1	5.37
RP6	9	5.354		27.41		
RP7	12	1.821		9.32	2	22.59
----	----	-----		-----		
TOTALS	7	60.943		44.58	3	10.16
					4 OR MORE	55.52

ACTIVITY INTERVAL TIME 19.556
 ACTIVITY GAP TIME 0.027

 TOTAL TIME 19.529

PCN 50033-P01

PART 1 OF 2 END PAGE 1

Figure 3-1. Spindle Summary

PCN 50038-003

SUMMARY BY DEVICE TYPE

REMOVABLE PACK ACTIVITY FROM 800115707.520 TO 800116703.048

DSU181 PACKS

PACK	QUANTITY	MOUNTED	ALLOCATED	ALLOC/MOUNT(%)	NO 170/ALLOCC(%)
DP002	0	1.706	0.000	0.00	0.00
DP011	0	1.706	0.000	0.00	0.00
DP016	0	1.706	0.000	0.00	0.00
DP037	0	1.706	0.000	0.00	0.00
DP074	2	7.667	6.757	88.13	61.22
DP031	1	5.901	4.685	79.39	66.47
DP027	3	12.816	9.046	70.58	55.82
DP028	4	9.018	8.577	95.11	65.61
DP072	3	1.627	0.441	27.11	18.78
DP052	1	2.286	0.690	30.19	16.21
DP010	1	2.286	0.193	8.42	57.13
DP016	1	5.348	5.044	94.31	64.49
DP064	1	0.634	0.386	60.89	28.53
DP044	5	2.893	0.855	29.56	29.02
DP042	2	10.569	4.487	42.45	49.09
DP047	2	11.427	4.237	37.08	18.84
DP001	3	4.387	3.174	72.36	41.75
DP008	1	2.814	2.676	95.11	59.81
DP021	1	0.884	0.718	81.29	30.71
DP106	1	0.994	0.553	55.64	35.10
DP004	4	2.560	0.330	12.90	66.66
DP053	1	0.856	0.248	29.03	66.63
DP033	1	0.386	0.166	42.88	66.61
DP032	3	3.798	0.496	13.05	33.36
DP036	2	1.873	0.055	2.94	0.00
DP048	2	6.880	2.478	36.01	26.67
DP026	3	6.630	1.047	15.78	31.58
DP034	1	2.889	0.110	3.81	24.99
DP039	2	6.796	0.495	7.29	22.22
DP025	1	1.073	0.523	48.74	26.32
DP055	1	3.824	2.421	63.32	35.22
DP043	1	0.770	0.055	7.15	9.00
TOTALS	54	126.708	60.943	48.10	50.31

PCN 50038-003

Figure 3-3. Summary By Device Type

PART 1 OF 2 END PAGE 1

PCN 50038-R04

ALERT LIST AS OF 20 JAN 24

PREPARED 20 JAN 31 FOR W5.4.2

THE FOLLOWING FILES HAVE NOT BEEN ACCESSED SINCE 29 MAR 79

USER MASTER CATALOG/FILE/STRING	CREATION DATE	LAST DATE ALLOCATED	MAXIMUM NO. LINKS	CURRENT NO. LINKS	NUMBER OF ALLOCATES
FOSDT02/C080P/0BJECT	780412	780911	30	10	18
FOSDT02/C080P/H	780425	780911	10	1	13
FOSDT02/PROGRAM/GMAP1	780412	780911	75	61	19
FOSDT02/C080P/SOURCE	780412	780825	20	13	13
FOSDT02/LCCA	780605	780607	150	30	3
FOSDT02/9SVUORN	780607	780607	120	20	2
FOSDT02/JHCCARJN	780607	780607	120	10	3
FOSDT02/PROGRAM/ALLOFIT	780530	780601	20	1	7
FOSDT02/PROGRAM/0BJECT	780531	780601	50	25	3
FOSDT02/PROGRAM/LASTPART	780531	780601	20	1	2
FOSDT02/PROGRAM/SOURCE	780412	780531	50	37	15
FOSDT02/PROGRAM/TEMP	780524	780531	20	3	19
FOSDT02/PROGRAM/COPIYDATA	780524	780531	20	1	8
FOSDT02/PROGRAM/ASCMAST	780525	780531	10	1	8
FOSDT02/PROGRAM/ASCTRANS	780525	780531	10	5	5
FOSDT02/C080P/EXFC	780524	780530	5	1	4
FOSDT02/PROGRAM/ASCTEMP	780525	780525	10	1	4
FOSDT02/TRANS	780525	780525	192	12	1
FOSDT02/C080P/A	780425	780511	10	1	2
FOSDT02/PROGRAM/GMAP2	780412	770912	75	75	23
FOSDT02/PROGRAM/MASTER	780524	770912	100	1	12
FOSDT02/PROGRAM/TRANS	780524	770912	100	13	33
*** TOTAL THIS USER MASTER CATALOG ***					323

PCN 50038-R04

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Figure 3-4. Alert List

PREPARED ON JAN 31 FOR 46.4.2 PERM DISK UTILIZATION SUMMARY AS OF 01 JAN 76 PCN 50038-005

USER MASTER CATALOGS BY ORGANIZATION	LINKS ASSIGNED	LINKS ALLOCATED	PERCENT ALLOCATED	PERCENT USED	ACTIVE LINKS
				**** SINCE 79 DEC 75 ****	
* SDA TOTALS	2300	1706	74 %	100 %	1706
FOSDMIS	550	419	76 %	0 %	0
* SDH TOTALS	550	419	76 %	0 %	0
FOSDM01	1200	692	58 %	20 %	136
FOSDM01	2100	1808	86 %	24 %	427
FOSDM01	1600	1269	79 %	43 %	549
PSOLUS	20150	10658	53 %	99 %	10764
SWAP	7900	7260	92 %	46 %	3539
SYSLIB	389	388	100 %	68 %	263
* DRTZ TOTALS	33539	22775	68 %	69 %	15678
FOSDT01	2220	2159	97 %	60 %	1293
FOSDT02	1125	1117	99 %	4 %	48
* SDT TOTALS	3345	3276	98 %	41 %	1341
FOXR01	360	242	67 %	54 %	130
* XWR TOTALS	360	242	67 %	54 %	130
FOXT01	400	71	18 %	100 %	71
FOXT02	100	50	50 %	100 %	50
* TOT TOTALS	500	121	24 %	100 %	121
FOXOP	10000	3149	31 %	99 %	3112
* XOX TOTALS	10000	3149	31 %	99 %	3112
**** PSDC TOTALS	93176	65766	71 %	83 %	54655

1 February 1980

PREPARED 79 SEP 19 FOR W6.4.1										REMOVABLE DISK UTILIZATION SUMMARY				AS OF 79 AUG 21				PCN 5003B-R06			
USER MASTER CATALOG	PACK NO.	TOTAL	ACTIVITY BY PERIOD (UNIT OF MEASURE - LLINK)			91+	UNC/ORG SUMMARY	TOTAL	ACTIVITY BY PERIOD (UNIT OF MEASURE - LLINK)			91+									
			0-30	31-60	61-90				0-30	31-60	61-90										
#K4CD30	FF00A	123001	123001				FKACD30	123001	123001												
								ORGANIZATIONAL TOTAL - ACD	123001	123001											
								COMMAND TOTAL - AU	123001	123001											
F0X0XP	FF00F	22036	117				F0X0XP	22036	117			21919									
								ORGANIZATIONAL TOTAL - XOX	22036	117		21919									
								COMMAND TOTAL - DSDC	22036	117		21919									

END PAGE 1

PCN 50038-R06
Figure 3-6. Removable Disk Utilization Summary

PCN 50719-RC7

AS 31 47 JAN 76

H6000 DISK STATUS SUMMARY

AVAILABLE LINKS

35200

DEDICATED TO SYSTEM FILES

44000

AVAILABLE FOR USER FILES

210000

CCAF	ASSIGNED	5000
	ALLOCATED	4715
	AVAILABLE	285
	PERCENT ALLOCATED	94 %

AU	ASSIGNED	85276
	ALLOCATED	73793
	AVAILABLE	11498
	PERCENT ALLOCATED	87 %

OSDC	ASSIGNED	93176
	ALLOCATED	65746
	AVAILABLE	27430
	PERCENT ALLOCATED	71 %

MISC	ASSIGNED	36488
	ALLOCATED	27917
	AVAILABLE	6521
	PERCENT ALLOCATED	77 %

ALLOCATED FOR WORK AREA

99500

CCAF	DISK AVAILABLE	285
AU	DISK AVAILABLE	11493
OSDC	DISK AVAILABLE	27430
MISC	DISK AVAILABLE	8521

TOTAL WORK AREA FOR TEMPORARY FILES

147272

PCN 50719-RC7

END PAGE 1

Figure 3-7. H6000 Disk Status Summary

PCN 50039-008

LIST OF USER MASTER CATALOGS AS OF 20 JAN 24

PREPARED ON JAN 31 FOR W6.4.2

USER MASTER CATALOG	LINK LIMIT	CURRENT LINKS	FMS OVERHEAD
FOACFN3	300	282	14
FOADLI9	800	782	3
FOADON	100	40	2
FOADON1	3000	1802	14
FOAMC02	2400	2274	26
FOAMIN1	1300	1123	10
FOGMM1	3000	1227	18
FOPR002	1500	1407	9
SARA-H	727	709	5
TAPELINR	2800	1159	3
WORD-PROC	1000	639	5
FOPRM01	9855	8273	38
FOPRM02	14000	13569	84
FOSCD01	1800	672	2
FOSDAA	2300	1706	18
FOSDHIS	550	419	15
FOSDM01	1200	692	11
FOSDMC1	2100	1808	64
FOSDMS1	1600	1269	25
PSOLUS	20350	10858	5
SWAP	7900	7760	32
SYSLIB	389	388	1
FOSDT01	2220	2159	17
FOSDT02	1125	1117	8
FOXMR01	360	242	19
FOXT01	400	71	3
FOXT02	100	50	1
FOX0XP	10000	3149	16
TOTAL FOR DSDC	93176	65746	468

PCN 50039-008

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Figure 3-8. List of User Master Catalogs

PREPARED 30 JAN 81		OLD FILES DELETED AS OF 30 JAN 81		PCN S0038-R09	
USER MASTER CATALOG/CATALOG/FILE/STRING	CREATION DATE	NUMBER OF ALLOCATES	DEVICE	CURRENT NUMBER LINKS	MAXIMUM NUMBER LINKS
AUTODIN/AUTOTEST/CARDS	791022	35	FIXED	10	10
AUTODIN/AUTOTEST/DATGEN	791024	2	FIXED	1	5
AUTODIN/AUTOTEST/MJOSTST	791106	11	FIXED	2	5
AUTODIN/AUTOTEST/RESIDUE	791022	40	FIXED	86	100
AUTODIN/AUTOTEST*/SELECT	791102	14	FIXED	85	100
AUTODIN/AUTOTEST/T020305	791029	24	FIXED	2	5
AUTODIN/AUTOTEST/TST0104	791022	22	FIXED	2	5
AUTODIN/AUTOTEST/TST0203	791022	10	FIXED	5	5
AUTODIN/CROSLIN/BASIC	791207	3	FIXED	2	20
AUTODIN/CROSLIN/COBOL1	791026	3	FIXED	10	50
AUTODIN/CROSLIN/COBOL2	791106	20	FIXED	7	140
AUTODIN/CROSLIN/COBOL3	791130	2	FIXED	4	60
AUTODIN/CROSLIN/COBOL	791022	18	FIXED	2	10
AUTODIN/CROSLIN/NEWAUTO/LRKSP	791023	16	FIXED	4	20
AUTODIN/CROSLIN/NEWAUTO/NEWMODS	791022	8	FIXED	146	2920
AUTODIN/CROSLIN/OLDMAST	791024	21	FIXED	12	192
AUTODIN/CROSLIN/TESTCOB2	791106	19	FIXED	1	20
AUTODIN/CROSLIN/TESTCOB1	791022	6	FIXED	1	20
AUTODIN/CROSLIN/TRANSACT	791024	4	FIXED	12	192
AUTODIN/CROSLIN/WORK1	791114	5	FIXED	5	20
AUTODIN/CROSLIN/WORK2	791116	1	FIXED	2	20
AUTODIN/CROSLIN/WORK	791109	6	FIXED	6	20
AUTODIN/MAC/FORTY1	791107	38	FIXED	1	5
AUTODIN/MAC/FORTY	791106	7	FIXED	1	5
AUTODIN/MAIT	791119	1	FIXED	10	10
CBTSCDTS/085304090	790810		FIXED	5	5
CBTSCDTS/222447575	790801		FIXED	5	5
CBTSCDTS/282446079	790810		FIXED	5	5
CBTSCDTS/340408407	790810		FIXED	5	5
CBTSCDTS/420361608	790801		FIXED	5	5
CBTSCDTS/438902041	791030	18	FIXED	5	5
CBTSCDTS/435909660	790810		FIXED	5	5
CBTSCDTS/486024753	790816		FIXED	5	5
CBTSCDTS/51347801	790810		FIXED	5	5
CBTSCDTS/CRL/LESSONS	790810		FIXED	5	5
CBTSCDTS/IDS/LESSONS	790608	1532	FIXED	400	400
CBTSCDTS/IDS/LESSONS	790610	222	FIXED	6	6
CBTSCDTS/IDS/LESSONS	790608	262	FIXED	425	425
CBTSCDTS/INT/TRANS	790610	212	FIXED	6	6
CBTSCDTS/INT/COROL061	790608	121	FIXED	4	4
CBTSCDTS/INT/LESSONS	790608	78	FIXED	1	10
CBTSCDTS/INT/TAPE1	790608	1282	FIXED	340	340
CBTSCDTS/INT/TAPE2	790609	110	FIXED	10	10
CBTSCDTS/ISP/DATA020	790809	35	FIXED	10	10
CBTSCDTS/ISP/DATA030	790816	162	FIXED	5	50
CBTSCDTS/ISP/DATA040	790816	62	FIXED	1	50
CBTSCDTS/ISP/LESSONS	790816	63	FIXED	1	50
CBTSCDTS/JOP/LESSONS	790816	311	FIXED	150	150
CBTSCDTS/OPR/LESSONS	790608	290	FIXED	760	760
	790613	218	FIXED	550	550

PREPARED 30 JAN 31		NEW FILES CREATED AS OF 30 JAN 24		PCN S0038-R10	
USER MASTER CATALOG/CATALOG/FILE/STRING	CREATION DATE	NUMBER OF ALLOCATES	DEVICE	CURRENT NUMBER LLINKS	MAXIMUM NUMBER LLINKS
AUTODIN/AUTOTEST/GENOBJ	800118	5	FIXED	13	50
AUTODIN/AUTOTEST/MJ00FO	791219	43	FIXED	5	15
AUTODIN/CROSLIN/BREAKLIB	800122	2	FIXED	2	40
AUTODIN/CROSLIN/DUMPT	800122	6	FIXED	5	5
AUTODIN/CROSLIN/GOPACOUT	800114	8	FIXED	1	20
AUTODIN/CROSLIN/NEAUTOI.PPUT	800110	5	FIXED	5	100
AUTODIN/CROSLIN/NEAUTOI/NEWMODS	800110	14	FIXED	114	2240
AUTODIN/CROSLIN/PACOUT	800110	21	FIXED	58	1020
AUTODIN/CROSLIN/TESTJCL/1-4-SPLY	791211	14	FIXED	2	40
AUTODIN/DUMMYKEY	800110	1	FIXED	1	5
AUTODIN/FORTMORT	800117	5	FIXED	1	20
AUTODIN/FORTOBJ	800121	4	FIXED	36	20
AUTODIN/FORTMORT	800121	2	FIXED	1	20
AUTODIN/OLD-MJ/MJ01FO	800108	5	FIXED	110	150
AUTODIN/OLD-MJ/MJ02FO	800108	2	FIXED	65	100
AUTODIN/OLD-MJ/MJ03FO	800108	2	FIXED	50	100
AUTODIN/OLD-MJ/MJ04FO	800108	20	FIXED	90	100
AUTODIN/7-243	800115	17	FIXED	1	20
CBTSCOTS/064380467	800108	26	FIXED	5	5
CBTSCOTS/155384557	791228	10	FIXED	3	5
CBTSCOTS/224648355	800108	10	FIXED	5	5
CBTSCOTS/258110248	800108	6	FIXED	5	5
CBTSCOTS/260986663	800110	3	FIXED	5	5
CBTSCOTS/309368443	800121	1	FIXED	5	5
CBTSCOTS/328420674	800109	10	FIXED	5	5
CBTSCOTS/403543096	791228	10	FIXED	5	5
CBTSCOTS/418746529	800108	11	FIXED	5	5
CBTSCOTS/418963818	791220	24	FIXED	5	5
CBTSCOTS/419223931	800122	3	FIXED	5	5
CBTSCOTS/422626513	800108	2	FIXED	5	5
CBTSCOTS/427261527	800103	5	FIXED	5	5
CBTSCOTS/435909660	791220	7	FIXED	5	5
CBTSCOTS/458217456	800121	18	FIXED	5	5
CBTSCOTS/480521238	800108	5	FIXED	5	5
CBTSCOTS/518401926	791219	5	FIXED	5	5
CBTSCOTS/554259313	800121	8	FIXED	5	5
CBTSCOTS/571604037	800110	2	FIXED	5	5
CBTSCOTS/587828004	800118	1062	FIXED	380	380
CBTSCOTS/CBL/LESSONS	780531	11	FIXED	8	11
CBTSCOTS/CDT/FVCSJLU	790821	26	FIXED	19	340
CBTSCOTS/CDT/SKELETON	781024	50	FIXED	55	55
CBTSCOTS/EMI/LESSONS	790409	907	FIXED	600	600
CBTSCOTS/GMP/LESSONS	781005	361	FIXED	380	380
CBTSCOTS/IDS/LESSONS	781113	21	FIXED	24	30
CBTSCOTS/IDS/LOADDATA	790726	12	FIXED	2	10
CBTSCOTS/IDS/TRANSDATA	790726	12	FIXED	2	10

PCN S0038-R10

PAGE 1

Figure 3-10. New Files Created

PCN 30038-R11
Figure 3-11. Pack Allocation Report
-
END PAGE 1

CATALOG ALLOCATION REPORT				PCN S0038-R12	
FILE CREATE DATES FROM 700612 TO 800124					
USER-MASTER CATALOG		MONTHLY		CURRENT	
LEVEL-1 CATALOG		ALLOCATION RATE		NUMBER LLINKS	
CLINK RATE				NUMBER LLINKS	
MAXIMUM				NUMBER LLINKS	
AULIB	12	641	333	925	
AULIB	ANALYSIS			244	887
AULIB	DEMO	1284	480	7875	
AULIB	SIMULATE		25	100	
AULIB	SOURCE	35	35	700	
AULIB	UTILITY		23	80	
AUTODIN	139	60066	40	85	
AUTODIN	AUTOTEST		84	400	
AUTODIN	CROSLIN	15588	1255	14302	
AUTODIN	FILEMGT	38908	9	160	
AUTODIN	OLD-MJ	600	571	740	
AUTODIN		3013			
CDTSCOTS	1407	72285	1308	1792	
CDTSCOTS	CBL		388	388	
CDTSCOTS	CDT	382	127	451	
CDTSCOTS	EMI	199	55	55	
CDTSCOTS	FTN	54	400	400	
CDTSCOTS	GMP	76	600	600	
CDTSCOTS	IDS	57	406	420	
CDTSCOTS	INT	412	325	334	
CDTSCOTS	ISP	320	132	275	
CDTSCOTS	JOP	1113	760	760	
CDTSCOTS	OPR	3	475	475	
CDTSCOTS	PDP	18	275	275	
CDTSCOTS	SIS	543	111	111	
CDTSCOTS	SUL	16	100	100	
CDTSCOTS	TAD	66	35	35	
CDTSCOTS	TOL	17	60	60	
CDTSCOTS	TUC	20	285	285	
CDTSCOTS	WBU	772	360	365	
CDTSCOTS	WSA	3147	755	764	
CDTSCOTS		8			
CDLLIB	22822	661244	623	670	
DATAMGT	11	3812	2233	08062	
DATAMGT	BELL		164	640	
DATAMGT	SRC		62	900	
FJCCAF1	245	114977	4715	10056	
FKACD11	730	99211	1655	15073	
FKACD11	33	17125	41	418	
FKACD11	3	1800	23	360	
FKACD30	5717	39682	12505	78983	
FKACD30			1	20	
FKACD30	DKASCH				
PAGE 1					
PCN S0038-R12					
Figure 3-12. Catalog Allocation Report					

PREPARED 80 JAN 31 FOR W6.4.2				FILE ALLOCATION REPORT				SQ038-R13			
FILE CREATE DATES FROM 700612 TO 800124											
USER MASTER CATALOG/CATALOG/FILE STRING				MONTHLY	CURRENT	MAXIMUM					
				ALLOCATION RATE	NUMBER LLINKS	NUMBER LLINKS					

PREPARED BY: JISK YAP				AS OF: 80 JAN 24		PCN S0038-R14	
FOR DEVICE 001 (OSS451)							
CYLINDER NUMBER	STARTING LINK	ENDING LINK	FILE SIZE	USER MASTER CATALOG/CATALOG/FILE STRING			
18	2760	2761	1	FKADY10/ONETM			
18	2761	2761	1	FKADY01/BILL/LDLFK			
18	2762	2762	1	FOACFJ3/MARKCOB0			
18	2763	2763	1	FOLGM01/A1/JCL/STATTEST			
18	2764	2765	2	FOPRM02/JMBPROB			
18	2766	2766	1	FKLMDCS/DELANEY2			
18	2767	2767	1	FOPRM02/DRIVSRC			
18	2768	2768	1	FKLMDCS/FONG4			
18	2769	2769	1	FKLMDCS/CLAS2MSR			
18	2770	2770	1	FKAD011/GOODJIN/SX48SOUR			
18	2771	2771	1	FKEC101/START26			
18	2772	2777	6	FOPRM01/CRTPERM/13491744			
18	2778	2783	6	FOPRM01/CRTPERM/13283420			
18	2796	2798	3	FKADS07/KAYE/HASEFILE			
18	2799	2799	1	FKADS07/BEDELL/TSTPGM			
18	2800	2804	5	FODMC01/MADE/COTS			
18	2805	2807	3	FOPRM02/CRTPERM/8611044			
18	3001	3001	1	FKADS07/FAULKNER/SE80UJ			
18	3002	3002	1	FKADS07/FAULKNER/SE80UJ			
18	3003	3006	4	FKADS07/KAYE/HASEFILE			
18	3007	3007	1	FKADS07/BEDELL/TSTPGM			
18	3008	3008	1	FOLGM01/A1/JCL/GUCETEST			
18	3009	3020	12	FOPRM01/FLD68			
18	3021	3052	32	FKADY09/BIGSTICK/BACKUP/FT/RFA06			
18	3053	3084	32	FKADY09/BIGSTICK/BACKUP/FT/RFA05			
18	3085	3116	32	FKADY09/BIGSTICK/BACKUP/FT/RFA03			
18	3117	3168	32	FKADY09/BIGSTICK/BACKUP/FT/RFA02			
18	3169	3180	32	FKADY09/BIGSTICK/BACKUP/FT/RFA01			
18	3181	3192	12	FKADS07/FAULKNER/SE2AUJ			
18	3193	3196	4	AUTODIN/CROSLIN/DUMPT			
18	3197	3200	4	FOPRM02/CRTPERM/14934070			
18	3201	3204	4	FKLMDCS/MSR80A			
18	3205	3205	1	FKLMDCS/CERT			
18	3206	3208	3	FKADY09/BIGSTICK/BACKUP/FT/RCM14			
18	3209	3211	3	FKADY09/BIGSTICK/BACKUP/FT/RCM13			
18	3212	3214	3	FKADY09/BIGSTICK/BACKUP/FT/RCM12			
18	3215	3217	3	FKADY09/BIGSTICK/BACKUP/FT/RCM11			
18	3218	3220	3	FKADY09/BIGSTICK/BACKUP/FT/RCM10			
18	3221	3223	3	FKADY09/BIGSTICK/BACKUP/FT/RCM09			
18	3224	3226	3	FKADY09/BIGSTICK/BACKUP/FT/RCM08			
18	3227	3229	3	FKADY09/BIGSTICK/BACKUP/FT/RCM07			
18	3230	3232	3	FKADY09/BIGSTICK/BACKUP/FT/RCM06			
18	3233	3235	3	FKADY09/BIGSTICK/BACKUP/FT/RCM05			
18	3236	3238	3	FKADY09/BIGSTICK/BACKUP/FT/RCM04			
18	3239	3239	1	FKADS07/KAYE/HASEFILE			

* AN ASTERISK INDICATES THIS FILE IS NOT CONTIGUOUS

PCN S0038-R14

PAGE 3

Figure 3-14. Disk Map

1 February 1980

PCN 50038-R15

PARAMETER? CARDS/ERRORS LIST

PREPARED 90 JAN 21

RISK STATUS-AVAIL 19LF LUTWKS=258000,SYSTEM FILES=43090*

DISK STATISTICS - WORK AREA=295070

INTERVAL - PERM = 37, ALFPT = 300.

UNIQUE JMC-FCS DM=SWAP,PSOLUS,SYSLIP*

UNIQUE 11'4C-F0P9D=SARA-H,W0RD-PROC,TAPEL.IPR*

STAFF AGENCIES - FOPPD=DOX,FKCSC=ACSC,FKAIC=AI/FOS*

STAFF AGENCIES - FORM=OFFICE, FOSDM=DXX

COQQAANDS-FJ=DSDC, FK=AJ, FJ=CFAF.

REPORTS-PICOP, JMC, RISK STATUS, ALERT

PCN 50735-015

END PAGE 1

Figure 3-15. Parameter Cards/Errors List.

PCN 500TP-R16

INPUT RECORDS/PARAMETER CARDS INFORMATION

PREPARED 79 DEC 27

SCF TACE # 66129 CONTAINS PACK MONITOR DATA FROM 791126/ 8.174 TO 791127/ 0.708

502 RECORDS WERE EXTRACTED FOR EKM3FO PROGRAM RUN

*** PARAMETER CARDS ***

INCLUDE FROM 791126/08.000 TO 791126/17.000;

*** TIME INTERVAL ANALYSIS ***

TIME INTERVALS FOR DETAIL REPORT

START--791126/ 8.000 STOP--791126/17.00"

TIME INTERVALS FOR SPINDLE REPORT

START--791126/ 8.000 STOP--791126/17.000

TIME INTERVALS FOR PACK REPORT

START--791126/ 8.000 STOP--791126/17.000

PRINT INTERVAL = 0.028

NOODPS IS F

PCN0099-R16

Figure 3-16. Input Records/Parameter Cards Information

END PAGE 1

PREPARED ON JAN 31 FOR W6.4.2		PERM DISK UTILIZATION SUMMARY AS OF 30 JAN 74			PCN 50036-RDS	
USER MASTER CATALOGS BY ORGANIZATION	LLINKS ASSIGNED	LLINKS ALLOCATED	PERCENT ALLOCATED	PERCENT USED	ACTIVE LINKS	
					**** SINCE 79 DEC 75 ****	
AULIS	1206	1160	95 %	77 %	873	873
AUTODIN	2500	1939	78 %	72 %	1403	1403
COTSCOTS	7659	6937	91 %	60 %	4192	4192
CMDLIB	650	623	96 %	97 %	603	603
DATANGT	3000	2459	82 %	12 %	307	307
GCDS3	2700	2604	96 %	100 %	2604	2604
GPSS	2175	172	8 %	0 %	0	0
GRISLI	2000	1513	76 %	41 %	613	613
HEALS-DATA	97	48	49 %	100 %	48	48
LIBRARY	5000	2104	42 %	33 %	685	685
ONSUTIL	1200	634	53 %	100 %	632	632
SPSS	1100	1083	98 %	95 %	1032	1032
TRAINING	1	1	33 %	100 %	1	1
WHRSS	7200	6600	92 %	100 %	6600	6600
**** MISC TOTALS	36488	27917	77 %	70 %	19613	19613
SYSTEM TOTALS	219940	172161	78 %	81 %	139403	139403

PCN 50033-RDS

END PAGE 7

Figure 3-17. PERM Utilization Miscellaneous Summary

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Director of Administration

RECORD LAYOUT			
FILE TITLE	RECORD TITLE	CLASSIFICATION	
STATISTICAL COLLECTION FILE	USER TYPE 732	UNCLASSIFIED	
		RCB/PCN	
FILE DESCRIPTION	RECORD POSITIONS	TYPE/CLASS	SPECIAL INSTRUCTIONS
Standard SCF Header:	(Unexpanded)		13 Words plus Block and Record Control Word
RECORD SIZE (-1)	1-3	BINARY SN	18 bits
RECORD TYPE	4-6	BINARY SN	18 bits
USER-HOST-SYSID	7-18	BCD 12AN	
SERVER-HOST-SYSID	19-30	BCD 12AN	
RECORD CREATION DATE	31-36	BCD 6N	Format: YYMMDD
RECORD CREATION TIME	37-42	BINARY SN	Recorded in clock pulses
SNUMB	43-47	BCD 5AN	
Unused	48		
UNIQUE IDENTIFIER	49-54	BINARY SN	36 bits
USERID	55-66	BCD 12AN	
Unused	67-68		
PROGRAM NUMBER	69	BINARY SN	
ACTIVITY NUMBER	70-72	BCD 3AN	Format: -nn
DATANET NUMBER	73	BINARY SN	
Unused	74-75		
TERMINAL TYPE	76	BCD 1AN	
TERMINAL ID	77-78	BCD 2AN	
User Record Data:			50 four-word Device Data Sets formatted as follows
INITIAL RECORD ID	79	BINARY S	1 bit (1 = Init. Record)
SAMPLE TIME	79-84	BINARY SN	35 bits
Device Data Sets:	85-1284		
Word 1 -			
DEVICE NAME		BCD 3AN	
MOD LOWER SCT+0:		BINARY	18 bits
ASSIGNABLE FLAG		BINARY	1 bit (0 = Assignable)
AVAILABLE FLAG		BINARY	1 bit (0 = Available)
DEDICATED FLAG		BINARY	1 bit (0 = Not Dedicated)
PRIMARY SCT FLAG		BINARY	1 bit (0 = Primary SCT)
SINGLE FILE FLAG		BINARY	1 bit (0 = Single File)
SINGLE DEVICE		BINARY	1 bit (0 = Single Device)
DEVICE TYPE		BINARY	6 bits
Unused			4 bits
RSRVD T&D FLAG		BINARY	1 bit (1 = Reserved-T&D)
TEMP STOPPED FLAG		BINARY	1 bit (1 = Temp Stopped)
Word 2 (SCT+1) -			
USAGE COUNT		BINARY SN	12 bits
Unused			1 bit
PACK STRUCTURE		BINARY	2 bits
			(continued)

RECORD LAYOUT			
FILE TITLE	RECORD TITLE		CLASSIFICATION
STATISTICAL COLLECTION FILE	USER TYPE 732 (continued)		UNCLASSIFIED
			RCS/PCN
FILE DESCRIPTION	RECORD POSITIONS	TYPE/CLASS	SPECIAL INSTRUCTIONS
Word 2 (SCT+1)(cont'd) QUANTITY OF MODULES ABSOLUTE ADDRESS OF LLINK TABLE		BINARY	3 bits
Word 3 - PACK NUMBER		BINARY	18 bits
Word 4 (SCT+2) - NUMBER OF CONNECTS ON DEVICE		BCD 6AN	Format: Dxnn
		BINARY	36 bits

RECORD LAYOUT			
FILE TITLE	RECORD TITLE		CLASSIFICATION
EKM4FOWU/EKM6FONU	FILE USAGE RECORD		UNCLASSIFIED
			RCB/PCN
FILE DESCRIPTION	RECORD POSITIONS	TYPE/CLASS	
		SPECIAL INSTRUCTIONS	
CURRENT DA	1-6	BCD 6AN	Format: YYMMDD
FILE CREATION DATE	7-12	BCD 6N	Format: YYMMDD
CURRENT FILE SIZE (LLINKS)	13-15	BINARY SN	18 bits
MAXIMUM FILE SIZE (LLINKS)	16-18	BINARY SN	18 bits
NUMBER OF ALLOCATES	19-24	BINARY SN	36 bits
DEVICE	25-30	BCD 6AN	Literal "FIXED" or removable pack number
USER MASTER CATALOG (UMC)	31-42	BCD 12AN	
LEVEL-1 CATALOG	43-54	12AN	
UMC-CAT-FILE STRING	55-120	BCD 66AN	
LAST DATE ALLOCATED	121-126	BCD 6N	Format: YYMMDD
MAXIMUM SMC GROWTH SPACE (LLINKS)	127-132	BINARY SN	36 bits
SPACE DESCRIPTOR OVERHEAD	133-138	BINARY SN	36 bits
SYSTEM IDENTIFICATION (.CRSID)	139-150	BCD 12AN	
NUMBER OF EXTENTS	151-156	BINARY SN	
EXTENT DESCRIPTORS (11 - 2-WORD ENTRIES):	157-288		
CURRENT DEVICE NAME		BCD 6AN	
CURRENT SPACE DE-SCRIPTOR		BINARY SN	
UNUSED	289-300		For future growth

DEPARTMENT OF THE AIR FORCE
Headquarters US Air Force
Washington DC 20330

CHANGE 1
AFM 171-606, Vol II
22 May 1981

Automatic Data Processing Systems and Procedures

H6000 DISK ANALYSIS (DIANA) SYSTEM: Q038/EK

USERS MANUAL

AFM 171-606, volume II, 1 February 1980, is changed as follows:

1. Purpose of Change. Modify documentation to allow for parameter input to EKM7FO.
2. Page Insert Changes. New or revised material is indicated by *.

Remove	Date	Insert
2-7, 2-8	1 Feb 80	2-7, 2-8
3-7, 3-8	"	3-7 thru 3-8.1
3-11, 3-12	"	3-11 thru 3-12.1
3-15, 3-16	"	3-15, 3-16
3-19, 3-20	"	3-19, 3-20
3-23, 3-24	"	3-23, 3-24
3-27, 3-28	"	3-27, 3-28

3. Write-In Changes:

Page	Paragraph	Line	Action
iii	3.3.1.17		Change "Error List" to read "Parameter Card/Error List".
2-3	2.4f	7	Between words "and" and "produces", insert "optionally".

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(2) Old Files Deleted Report (PCN SQ038-R09). Displays files deleted during the time period.

(3) New Files Created Report (PCN SQ038-R10). Displays files created during the time period.

(4) Data Base Comparison Error List (PCN SQ038-R20). Displays records deleted due to file creation dates.

2.7.6 DISK PACK CAT/FILE DATA REDUCTION PROGRAM. EKM7FO produces removable pack, catalog, and file reports from data collected by EKM4FO or from the merged output file of EKM6FO. Disk utilization at the device and catalog/file level is determined by calculating the number of times files associated with catalogs or devices are allocated.

- * a. Inputs. Inputs consist of records produced by EKM4FO or EKM6FO and user supplied card input for report selection. Options are covered in paragraph 3.2.1.6 of this manual. Source of record input is dependent on the purpose for running EKM7FO.
- * b. Processing. Report options are determined by the user supplied card and two metrics provide the basis for the three reports. First, the Monthly Allocate Rate defined as the total number of times the file was allocated divided by the number of days the file has been in existence multiplied by 30 days per month. The second metric is the CLINK rate, defined as 10 times the file's Monthly Allocate Rate divided by the file size in blinks. Reports are then produced according to requirements specified.
- c. Outputs. Four output reports are possible.
 - (1) Pack Allocation Report (PCN SQ038-R11). Displays the utilization of files associated with a particular pack number.
 - (2) Catalog Allocation Report (PCN SQ038-R12). Displays the utilization of files by catalog.
 - * (3) File Allocation Report (PCN SQ038-R13). Displays files with user requested monthly allocation rate.
 - * (4) Parameter Card/Error List (PCN SQ038-R17). Displays parameter card with any associated errors and gives the number of records, if any, excluded from processing.

2.7.7 THE DISK MAP PROGRAM. EKM8FO provides a map by catalog/file string of the current location of the files on disk.

a. Input. Input is from the Catalog/File Descriptor Monitor (EKM4FO). A card input file specifies processing options.

b. Processing. Input is sorted by physical location with device name. The temporary sorted file is then output by cylinder, indicating starting link, ending link, and file size for each catalog/file on a

particular device, by name and type. The acceptable device types are DSS180, DSS181, DSS190, DSS191 and DSS451.

c. Outputs. Two output reports are produced.

(1) Disk Map Report (PCN SQ038-R14). A report identifying the location of each file residing on fixed or removable disk.

* (2) Parameter Cards/Error List (PCN SQ038-R18). Provides a list of parameter cards with any associated errors.

EKM5FO CARD FORMAT 5	POSITION	INSTRUCTIONS
AAAAAA=XXXXXX	After 15	The first five characters of a UMC replace the "A"s. A staff office code between two and six characters replace the "X"s. If less than six characters are used, blanks will be in the remaining positions.

NOTE: Study examples in paragraph 3.2.4 before utilizing this option.

EKM5FO CARD FORMAT 6	POSITION	INSTRUCTIONS
UNIQUE UMC-	1-11	This card is used to associate nonstandard UMCs with a standard USERID. Standard USERIDs are covered in AFM 171-100, Volume II.
UUUUUU=AAAAAAAAAAAA	After 11	In the format, the "U"s should be replaced with the first five letters of the standard USERID. The "A"s should be replaced with the nonstandard USERIDs, which may vary from two to 12 characters in length. Nonstandard USERIDs are then separated by a comma with the last nonstandard USERID followed by an asterisk. Up to 200 UMC associations are possible.

*	Variable	Must be present and delineates the end of parameter card.
---	----------	---

3.2.1.5 EKM6FO. No staff inputs are needed to execute this program.

- * 3.2.1.6 EKM7FO. Input to this program consists of one parameter card which allows user selection of output reports. All options must be separated by a comma and an "*" is used to delineate the input card. Options may be specified in any order. The format is as follows:

EKM7FO CARD FORMAT	POSITION	INSTRUCTIONS
REPORTS-	1-8	Any combination of desired reports may be selected. The following is a list of key words and the PCN reports they generate:

3-8

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EKM7FO CARD FORMAT

	POSITION	INSTRUCTIONS
PACK	AFTER 8	Produces Pack Allocation Report (PCN SQ038-R11) only.
CATALOG	AFTER 8	Produces Catalog Allocation Report (PCN SQ038-R12) only.
FILE-NNN	AFTER 8	Produces File Allocation Report (PCN SQ038-R13) only. "N"'s in format should be replaced with an integer specifying a monthly allocation rate. Based upon specified monthly allocation rate FILE-NNN, FILE=NNN, and FILE+NNN will list files less than or equal to NNN, equal to NNN, or greater than or equal to NNN respectively.
FILE=NNN	AFTER 8	
FILE+NNN	AFTER 8	
*	VARIABLE	Must be present and delineates end of parameter card.

Any or all options may be specified, but a comma is required to separate the options. An asterisk is required following the last option specified to indicate that all the reports desired have been entered.

3.2.1.7 EKM8FO. Input to this program consists of one or more parameter cards which allow user selection of device records for processing. The formats are as follows:

EKM8FO CARD FORMAT 1

	POSITION	INSTRUCTIONS
PERM*	1-5	If more than one type resides on the system, the types (180, 181, 190, 191, 451) must be entered beginning in column 9 separated by a comma.

NOTE: If this card is used it must be the first input card.

EKM8FO CARD FORMAT 2	POSITION	INSTRUCTIONS
RMVBL*	1-6	Use this parameter to map removable packs. The number of packs to be mapped should replace the "N"s. No delimiter is required. This card is followed by input from card format three.
NNN	9-12	

EKM8FO CARD FORMAT 3	POSITION	INSTRUCTIONS
XXXXX	1-5	The "XXXXX"s should be replaced with a pack name and the "TTT"s with the type of pack. The number of cards with this format must be the same number as entered on card format two.
TTT	9-11	

3.2.2 COMPOSITION RULES. All parameters should start in card column one unless otherwise specified. Grammatical rules and punctuation that must be observed in order to prepare input are covered by parameter card in paragraph 3.2.1.

3.2.3 INPUT VOCABULARY. NA.

3.2.4 SAMPLE INPUTS. Sample inputs are presented in this section for each program.

3.2.4.1 THE REMOVABLE DISK PACK MONITOR (EKM1FO).

a. Parameter Inputs. After initiation of the JCL found in AFM 171-606, Volume I, GCOS will ask for privity to be granted. After privity is granted the following message will print on the console:

- - - EKM1FO IN EXECUTION - - - ENTER SAMPLE TIME (NN SECS, 15 to 99)

The operator will then input a value from 15 to 99. The input sample interval is the time between snapshots of the SCT. Records will be written to the SCF according to this parameter. The user must also provide the time of day when the operator should terminate the monitor.

3.2.4.2 THE REMOVABLE DISK PACK DATA REDUCTION (EKM3FO).

a. Parameter Inputs. A maximum of 10 different time intervals with the three following reports are possible per XSCF tape: Spindle Summary (PCN SQ038-R01), Detail By Spindle (PCN SQ038-R02), and Summary By Device Type (PCN SQ038-R03). The absence of any parameter cards will

(3) In this example, card format three is used to input three values, which the user must supply to produce PCN SQ038-R07. Total available llinks on the system has been entered as 258,000, the amount of space used by system files is 48,000 llinks, and temporary work space has been set at 99,500 llinks.

Example:

DISK STATUS-AVAILABLE LLINKS=258000,SYSTEM FILES=48000*
DISK STATUS-WORK AREA=99500*

(4) In this example, card format five provides command breaks for PCN SQ038-R05, PCN SQ038-R06, PCN SQ038-R07, and PCN SQ038-R08. It also provides a command name to be substituted for command code for report purposes.

Example:

COMMANDS-FO=DSDC,FK=AU*

(5) In this example, card format six provides names which are substituted for organizational totals in PCN SQ038-R05 and PCN SQ038-R06.

Example:

STAFF AGENCIES-FKCSC=ACSC,FKAIC=AI/FOS*
STAFF AGENCIES-FOPGC=PHASE4*
STAFF AGENCIES-FKRTC=ROTC,FOSDT=SDS,FKLMD=LMDC*

(6) In this example, card format seven is used to associate nonstandard USERIDs to standard USERIDs. This allows all the attributes of a nonstandard USERID to be accumulated under a specified UMC.

Example:

UNIQUE UMC-FOPRD=WORD-PROC,SARA-H,TAPELIBR*
UNIQUE UMC-FOSDM=SWAP,FOSDAA,DATAMGT,PSOLUS,SYSLIB*

3.2.4.5 THE DISK INTERVAL UTILIZATION PROGRAM (EKM6FO).

- a. No parameter inputs are required.

3.2.4.6 THE DISK PACK CATALOG/FILE DATA REDUCTION PROGRAM (EKM7FO).

- * a. Parameter Inputs. Input to this program consists of a single parameter card which allows user selection of output reports.

- * (1) In the example below all reports will be generated. The File Allocation Report (PCN SQ038-R13) will be produced for all files with a monthly allocation rate greater than or equal to 20.

Example:

REPORTS-PACK,FILE+20,CATALOG*

- * (2) In the example below the File Allocation Report (PCN SQ038-R13) will be produced for all files with a monthly allocation rate less than or equal to 5.

Example:

REPORTS-FILE-5*

3.2.4.7 THE DISK MAP PROGRAM (EKM8FO).

a. Parameter Inputs. Inputs to this program specify which devices on PERM or which removable packs are to be mapped.

(1) In the following example the user has specified for all 181 and 451 PERM disk to be mapped, along with two removable packs for each of these type devices:

Example:

PERM*	181,451
RMVBL*	4
DP001	181
DP002	181
DP003	451
DP004	451

(2) In the following example the user has specified that only the PERM disk be mapped:

Example:

PERM*

(3) In the following example the user has specified that only two removable packs be mapped:

Example:

RMVBL*	2
DP001	451
DP002	191

3.3 OUTPUT REQUIREMENTS. Output requirements vary depending on the purpose and the amount of data the user has chosen to examine. The two monitors, EKM1FO and EKM4FO, generate data records. These records are then input into the appropriate data reduction program for desired reports. The use of these reports is discussed in detail in paragraph 3.4..

3.3.1 OUTPUT FORMATS.

3.3.1.1 PCN SQ038-R01, SPINDLE SUMMARY REPORT. (See figure 3-1) This report provides a summarized list, by spindle type and name, of the number of packs mounted, allocated time (time pack was mounted and user files were open), and percent of time that a spindle was allocated over a time interval. The number of spindles available for assignment by the peripheral allocator during the sample period is shown in the upper right-hand corner of the report. The trailer contains information about the sequence of produced reports. "SECTIONS" correspond to the order and number of reports within the requested intervals. "PART" corresponds to the different types of devices included within the report.

3.3.1.2 PCN SQ038-R02, DETAIL BY SPINDLE REPORT. (See figure 3-2) This report provides a detailed look at activity occurring on each spindle configured for removable packs. Directly under each spindle name the

column headings. Spaces under "NUMBER OF ALLOCATES" indicate zero allocations.

3.3.1.11 PCN SQ038-R11, PACK ALLOCATION REPORT. (See figure 3-11) The report provides a summary for both removable and fixed files creation. Fixed devices are grouped together and shown under "DEVICE" as "FIXED". For removable, the pack name is given under the "DEVICE" column. The "MONTHLY ALLOCATION RATE" is given for fixed and each pack. "CURRENT NUMBER LLINKS" is the amount of file space occupied on the device. "MAXIMUM NUMBER LLINKS" is the amount of file space that would be occupied if all files on the device grew to their maximum size. "NUMBER OF UNLIMITED FILES" is the number of files that can grow to the maximum allowed to the UMC.

3.3.1.12 PCN SQ038-R12, CATALOG ALLOCATION REPORT. (See figure 3-12) The report provides a statistical summary of usage by UMC subdivided into level one catalogs. The "FILE CREATION DATES" heading shows the creation date of the earliest and latest files in the data base. The UMC along with any level one catalogs, if applicable, is given. Statistics for quick access files for a UMC will be indicated by spaces under the "LEVEL-1 CATALOG" heading. A Clink rate along with current and maximum number of llinks is also given.

* 3.3.1.13 PCN SQ038-R13, FILE ALLOCATION REPORT. (See figure 3-13) The report provides by catalog file string a list of those files having user requested monthly allocation rate. The "FILE CREATION DATES" heading shows the dates from the oldest file to the most recent. The files are listed according to the monthly allocation rate in descending order. In adjacent columns the file's current and maximum file size is given. The "DEVICE" column indicates where the file is located. If the file is occupying permanent space, "FIXED" will be printed. Otherwise, the pack name for the file will be listed.

3.3.1.14 PCN SQ038-R14, DISK MAP. (See figure 3-14) This report provides an absolute location map of files contained on either fixed or removable devices. The heading indicates which device is being mapped. "CYLINDER NUMBER", "STARTING LLINK", "ENDING LLINK" and "FILE SIZE" are shown. Adjacent to these columns is the catalog file string for each file.

3.3.1.15 PCN SQ038-R15, PARAMETER CARD ERROR LIST. (See figure 3-15) The report is a list of the parameter cards entered into EKM5FO. If a parameter card is in error, a message will be given immediately below it.

3.3.1.16 PCN SQ038-R16, INPUT RECORDS/PARAMETER CARDS INFORMATION. (See figure 3-16) This report is produced by EKM3FO. The first line provides information about the tape number, dates/times of the information on the tape. Under "PARAMETER CARDS" is a list of the input cards with error messages immediately following. Under "TIME INTERVAL ANALYSIS" a breakdown of start-stop dates/times is given for each report. After the interval analysis, the "PRINT INTERVAL" used to generate the Detail Report is given. Next is the print suppression

option used for the Detail Report. The "NODUPS IS F" statements indicate no suppressing of printing while "NODUPS IS T" indicates there was suppressing of duplicate print lines. Any date/time group requested outside the available data on the tape will be listed next.

- * 3.3.1.17 PCN SQ038-R17, PARAMETER CARD/ERROR LIST. This report is produced by EKM7FO. The error messages are explained in paragraph 3.5.2.5.

3.3.1.18 PCN SQ038-R18, PARAMETER CARDS/ERROR LIST. This report lists the input parameter cards of EKM8FO along with any associated errors. The errors are explained in paragraph 3.5.2.6.

3.3.1.19 PCN SQ038-R19, INPUT PARAMETER CARDS LIST. This report lists the input parameter cards of EKM4FO along with any associated errors. The errors are explained in paragraph 3.5.2.2.

3.3.1.20 PCN SQ038-R20, DATA BASE COMPARISON ERROR LIST. This report shows how many files were excluded from processing because of an invalid file creation date.

3.3.2 SAMPLE OUTPUTS. Samples in this section of the manual have been chosen to highlight print options or unusual events that might surface in the reports. Other reports not covered in this section have sufficient explanation given in paragraph 3.3.1.

3.3.2.1 PCN SQ038-R02, DETAIL BY SPINDLE. Figure 3-1 shows an example of the Spindle Summary Report. The box on the right-hand side contains statistics for all removable 181 spindles during the specified time period. The "% TOTAL TIME" is the percent of time during the interval the corresponding number of spindles was available. For example, there was one spindle available 5.37% of the time while two spindles were available 22.59% of the time.

3.3.2.2 PCN SQ038-R05, PERM DISK UTILIZATION SUMMARY. Figure 3-5 shows partial output resulting from parameter cards used in figure 3-16. The "UNIQUE UMC" card is used to associate the unique UMCs (SWAP, PSOLVS and SYSLIB) to the standard UMC (FOSDM). The "STAFF AGENCIES" card is used to substitute 0x22 for the staff organization totals. Otherwise, totals for the staff organization would be listed as SDM. Notice, the default for not using the "STAFF AGENCY" card is characters 3-6 of the UMC as in the XOT totals. The totals by command are given at the bottom of the page. To receive these totals the "COMMANDS" input parameter card must be used. Figure 3-17 shows the category in which all nonstandard User Master Catalogs not associated with standard User Master Catalogs are summarized. This summary will always appear just before the system totals.

3.3.3 OUTPUT VOCABULARY. NA.

3.4 UTILIZATION OF SYSTEM OUTPUTS. There is no single method of deducing "optimum disk performance" from DIANA reports. The reports provide information which, when combined with the disk manager's knowledge of the specific system monitored, allow insight to the disk

percentages below the 75% level indicate the user should choose other media for some files. Identification of these files can be accomplished by using the trend analysis portion of DIANA.

3.4.6 REMOVABLE DISK UTILIZATION SUMMARY. PCN SQ038-R06 is produced by EKM5F0 to provide the disk manager information with which to monitor removable disk pack assignments. This report provides the total number of LLINKS residing on a specific pack, displayed by activity periods and summarized by USERID, organization, and system. The following conditions usually indicate problem areas:

a. Packs having a large number of blocks accessed within a 30-day period should be investigated using the Removable PACK Monitor (as indicated in attachment 1) to determine if a problem exists. If a problem does exist, optimization of file placement should be initiated using periodic trending techniques to identify files which should be considered for placement on PERM disk.

b. USERIDs or organizations with multiple packs containing large amounts of unused file space should be combined on one pack.

c. Packs with high amounts of inactive space; i.e., files inactive over 90 days, are candidates for transfer to magnetic tape.

3.4.7 H6000 DISK STATUS SUMMARY. PCN SQ038-R07 is produced by EKM5F0 and provides an overview of the use of PERM space by the system in summarized form. This report displays space used by system files, and by separate commands and provides a breakdown of the space allocated for work area (temporary files). The following conditions usually indicate problem areas:

a. Large amounts of available disk generally indicate users have requested more space than actually required, or that past justifications for previous projects are no longer valid. In either case, further investigation is warranted.

b. Systems continually having an abundance of temporary files could allocate more space to PERM or reconfigure and add an additional removable spindle. Care should be exercised in these measures, however, and "minimum work area available" peaks should be checked out using the SYRUP monitor. SYRUP information should provide the disk manager with the optimum amount of space by which to reduce the work area.

3.4.8 USER MASTER CATALOG REPORT. PCN SQ038-R08 is produced by EKM5F0 to provide information which will allow the disk manager to effectively evaluate requests for PERM space. This report lists the UMCs and displays maximum limit, current space used, and space used by catalog pointers to that UMC. The UMCs are then summarized by command to which they are assigned. This report is useful to:

a. Determine if user PERM space requirements are current.

b. Identify USERIDs with excessive FMS overhead.

c. Keep track of the systems PERM space assigned.

3.4.9 OLD FILES DELETED REPORT. PCN SQ038-R09 is automatically produced when the user chooses to perform trend analysis with EKM6FO. This report contains a list of files which have been removed during the selected time interval. Examination of this report and comparison with PCN SQ038-R10, New Files Created Report, can reveal trends in user activity.

3.4.10 NEW FILES CREATED REPORT. PCN SQ038-R10 is identical to the Old Files Deleted Report except that it is a list of files created during the trend analysis period selected.

3.4.11 PACK ALLOCATION REPORT. PCN SQ038-R11 provides accumulated totals by pack on parameters needed to identify problem areas for periodic trending. The following conditions indicate areas for further investigation:

a. Packs with high monthly allocation rates generally indicate high activity files residing on that pack, which causes high contention for removable spindles. Further investigation of the reports within EKM7FO should identify files which should reside on PERM.

b. Packs which have a low number of current LLINKS and high monthly allocation rates are also identified. Combining of these packs with other removable user's packs could possibly reduce the number of physical packs on the system and increase the odds of concurrent usage to that pack, thereby increasing system efficiency and decreasing spindle contention.

3.4.12 CATALOG ALLOCATION REPORT. PCN SQ038-R12 provides information on level one catalogs which will aid the disk manager in deciding which catalogs are candidates for removable or PERM media. Because of the methodology associated with the Honeywell job structure it is not always possible to separate files within a catalog. Moving one file does not always eliminate unnecessary pack mounts. Therefore, entire catalogs may have to be moved to insure a reduction in pack mounts. This report displays a calculated activity to file size (CLINK) rate for each catalog. CLINK rates for catalogs with the same space requirement can be compared. Those with higher rates should be considered the better candidates for transfer to PERM spindles. There are exceptions to this rule concerning files which are allocated during long intervals of time. This condition is generally known by the disk manager and the files are usually already assigned to PERM. The small percentage of these files which do exist on packs can be identified with continued runs of DIANA following the transfer of previously identified candidates for PERM. Dealing with these will require further analysis using EKM8FO and GMF.

* 3.4.13 FILE ALLOCATION REPORT. PCN SQ038-R13 furnishes the disk manager a list of those files meeting the monthly allocation rate parameter input to EKM7FO. Files that are allocated more often appear at the front of the list and inactive files at the back. Removable candidates can be identified by noting files with the higher allocation and reviewing the "PACK" column of the report

MESSAGE

INVALID OPTION (NOT INCLUDE FROM,
PRINT INTERVAL OR NODUPS)

INTERVAL YYMMDD/HH.TTT TO
YYMMDD/HH.TTT OUTSIDE RANGE OF TAPE

NO TYPE 732 RECORDS

NO PACK MONITOR RECORDS FOUND

3.5.2.2 EKM4FO ERROR MESSAGES. These error messages are possible in
report PCN SQ038-R19.

MESSAGE

FIRST CARD NOT FIXED, FIRST OR NEXT

NO PARAMETERS INPUT

NO REMOVABLE PACK NAME CARD FOUND

* NUMBER OF UMCS ON SYSTEM EXCEEDS
1500

* CAT/FILE XXXXXXXX IS LINKED
TO DEVICE DDD

REASON

The input card does not comply
with any card formats in paragraph
3.2.1.2. Make changes and
reexecute EKM3FO.

The selected date-time intervals
are outside the range of the input
data tape. Make corrections and
reexecute EKM3FO.

The message indicates no Type 732
expanded records were found on the
input tape. Insure the start-up
deck has been properly configured
and the Type 732 records are being
expanded by GSEP.

The message indicates no records
were found. Insure the start-up
deck has been properly configured
and the Type 732 records are being
expanded by GSEP.

REASON

The initial input parameter card
must contain the proper control
word (FIXED, FIRST or NEXT).

At least one input parameter card
must be included with each execu-
tion of this program.

At least one pack name card (card
format four) must be input if the
"NEXT" control word is specified.

System design will not permit pro-
cessing of greater than 1500 UMCS.
If this problem occurs, report it
to AFDCSC/SCCA, AUTOVON 921-4021.

Specified CAT/FILE has an FMS
structure pointing to a device
currently not configured on your
system. CAT/FILE will be ignored
and processing will continue.

MESSAGE

REASON

* SYSTEM CURRENTLY HAS AT LEAST
10 FILES LINKED TO INVALID
DEVICES

At least 10 CAT/FILES are pointing to invalid devices. If this problem occurs, report it to AFSDSDC/SCCA, AUTOVON 921-4021.

NO UMC DATA FOUND

No UMC data on configured PERM disk is available. According to the GCOS system tables, permanent disk is not configured online. If problem persists, contact AFSDSDC/SCCA, AUTOVON 921-4021.

3.5.2.3 EKM5FO ERROR MESSAGES. These error messages are possible in report PCN SQ038-R15.

MESSAGE

REASON

INVALID REPORT SELECTION

The card scan could not find one of the following: UMC, DISK STATUS, ALERT, PERM, or REMOVABLE. Insure only these parameters are on input card format one of paragraph 3.2.1.4.

INVALID OR MISSING DELIMITER
(,), (*)

The card scan could not find a ", between options or there was no "*" at the end of the card. This error is possible for all format cards of paragraph 3.2.1.3.

INVALID REPORT INTERVAL SELECTION

The card scan could not find either "PERM=" or "ALERT=" on card format two of paragraph 3.2.1.4.

INVALID PARAMETER CARD NAME OR
FORMAT

The card scan looking for either the suffix "s-" or "-" at the end of options such as "COMMANDS-" or "INTERVAL-". Make changes and reexecute EKM5FO.

NO "=" SIGN FOUND OR WONG NUMBER OF
INPUT CHARACTERS

The card scan expecting an "=" on the "COMMAND" and "UMC" association card. This error is also given if the improper number of characters are used on either side of the equal sign. Reference paragraph 3.2.1.4 for proper format.

ALERT LIST INTERVAL OUT OF RANGE

The alert range is less than 30 days and greater than 365.

MESSAGE

REASON

NNN RECORDS WERE EXCLUDED FROM ALLOCATION REPORTS DUE TO INVALID FILE CREATION DATES

This message only prints when records were excluded because of date-editing checks for the file creation date.

NNN RECORDS WERE EXCLUDED FROM PACK ALLOCATION REPORT DUE TO TABLE SIZE LIMITATION

The message only prints when records were excluded because more than 100 packs are found on the input data base.

* INVALID PARAMETER CARD NAME OR FORMAT

The card scan was expecting the suffix "-" at the end of "REPORTS". Make changes and reexecute.

* DELIMITER MISSING OR INVALID OPTION SPECIFIED

The card scan could not find a "," between options or there was no "*" at the end of options. An invalid option can also cause this message. Make changes and reexecute.

* A NON-NUMERIC VALUE OR NO VALUE ENTERED FOR ALLOCATION RATE

Invalid entry following "FILE-", "FILE=", or "FILE+". Make changes and reexecute.

* ILLEGAL REPORT OPTION

Only options under paragraph 3.2.1.6 are allowed. Check to insure options specified comply with this paragraph and reexecute.

* ALLOCATION RATE DELIMITER ERROR

The card scan was expecting a "+", "-", or "=" after "FILE". Make changes and reexecute.

3.5.2.6 EKM8FO ERROR MESSAGES. These error messages are given in report PCN SQ038-R18.

MESSAGE

REASON

INVALID DISK DEVICE TYPE

Reference paragraph 3.2.1.7, EKM8FO, for valid PERM disk types and correct input format.

INVALID REMOVABLE DEVICE TYPE

Reference paragraph 3.2.1.7, EKM8FO, for valid removable disk types and correct input format.

MESSAGE

REASON

EXPECTED (PERM*/RMVBL*) CARD FORMAT

PERM or removable control cards expected. Reference paragraph 3.2.1.7, EKM8FO, for correct format and instructions.

REMOVABLE PACK CARDS FEWER OR GREATER THAN SPECIFIED

The number of removable packs specified in the input parameters is not equal to the number of packs to be mapped. Reference paragraph 3.2.1.7, card formats, two and three for instructions.

NUMBER OF PACKS OUTSIDE RANGE

The number of removable packs must be a number between one and 100 inclusive.

UNEXPECTED END OF FILE

At least one input parameter card must be included with each execution of this program.

PERM* CARD MUST PRECEDE RMBVL* CARD

If permanent disk types are to be mapped, then the PERM* card must be the first input parameter card.

ONLY ONE RMBVL* CARD PERMITTED

Multiple "RMVBL" cards are not allowed. All removal disk names may be specified on a single parameter card.

ONLY ONE PERM* CARD PERMITTED

Multiple "PERM" cards are not allowed. One entry is sufficient for all permanent disk types.